

CACTUS AND SUCCULENT JOURNAL

VOL. XXXII

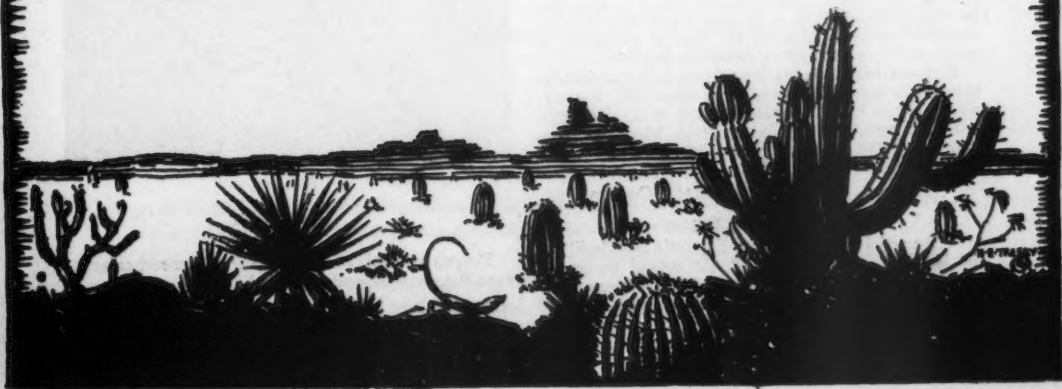
MARCH-APRIL, 1960

No. 2



FIG. 19. *Rebutia minuscula* is one of our easiest-to-flower cacti.

From "Flowering Succulents" by Rowley.



CACTUS AND SUCCULENT JOURNAL

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VOL. XXXII

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No. 2

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CACTUS ORPHANS—COMMENTS

The article by Mrs. Cactus Pete is stimulating and it also raises many questions. For instance, what is the Epiphyllum Society of America doing in the way of research? Classification is not the role of the collector. The flowers of night blooming species cannot be studied in the habitats. The logical procedure is to produce flowers under cultivation. The commercial grower of orchid cacti has the facilities to do that, and, it seems to me, he should have the incentive to study and describe.

Is cultivated "Epiphyllum" ackermannii an old hybrid of European origin, or is it a native of Mexico? Mrs. Cactus Pete says "—a wild Mexican hybrid, ackermannii—escaped into many part of the Mexican jungle." Is there evidence to support this view?

Why should it be a mistake to use the name *Kinchinunga*? In Oaxaca we often have several names in Spanish for any one plant species, plus one or more in each of the twenty odd native languages spoken within the state. These names do not interfere with botanical classifications.

The misapplication of botanical names is another matter. I think the lobed "silhouette" on the right of the chart (Jour. XXXII, pg. 15) may not be typical *Epiphyllum anguliger*. I believe it was introduced to cultivation by the Beahm Gardens? It might be better known at Gertrude Beahm?

Perhaps Mrs. Cactus Pete is unduly pessimistic about new numbers losing their identities? Personally, I try to keep accurate records of the *Epiphyllum* numbers I collect in the field. Most of these numbers have been sent to either, or both, the N.Y.B.G. and the U.C.B.G.

T. MACDOUGALL, Oaxaca, Oax.

AUTHOR'S CORRECTION

In the article "Epitaph ? to *Eopuntia douglasii*" in the Jan.-Feb. Journal, page 28, the second paragraph should be, "In 1938" instead of 1958.—Herman F. Becker.



FIG. 20

WHAT'S IT?

Do you know this *Echinocereus*? If you recognize it, send the name to your favorite Editor.

STEVE PHOTO

CULTIVATED AND NATIVE AGAVES IN THE SOUTHWESTERN UNITED STATES

AUGUST J. BREITUNG
1416 S. Glendale Ave., Glendale, California

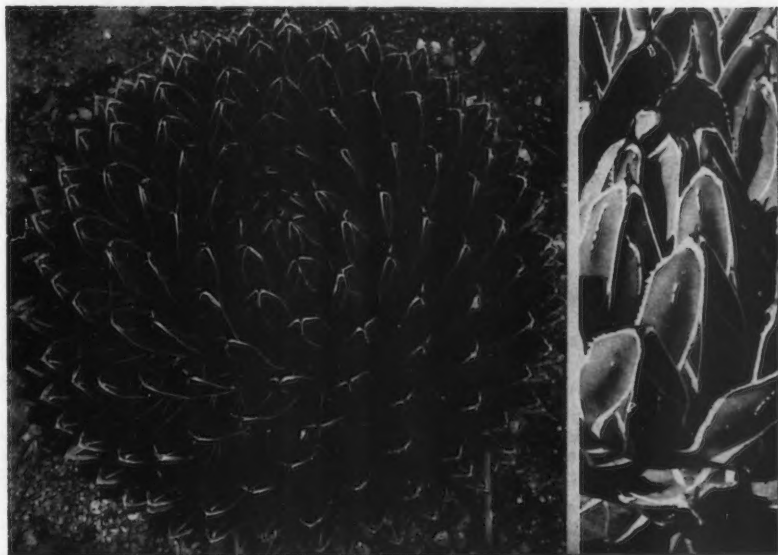


FIG. 21

Agave victoriae-reginae. Left: grown in the Huntington Botanical Garden, San Marino, California. Approx. $\frac{1}{4}$ natural size. Right: *A. victoriae-reginae* forma *dentata*. Grown by Hubert Monmonier, Los Angeles, Calif., from seed collected in Mexico. Approx. $\frac{1}{2}$ natural size.

PART 7

Agave victoriae-reginae T. Moore, Gard. Chron. new series 4: 484, 1875.

A. consideranti Carr. Rev. Hort. 1875: 429, 1879.

Distribution: Nuevo León, Coahuila and Durango; Type locality: near Monterrey, Nuevo León.

Rosette usually single or with few offsets, rarely densely caespitose, 5 to 7 dm. in diameter, very leafy; leaves 10 to 15 cm. long, 5 to 7 cm. broad, acute, abruptly narrowed to a rounded apex, straight or incurved, very rigid, glabrous, dark green with conspicuous irregular white markings or these rarely absent, concave above, convex beneath and sharply keeled above middle; terminal spine 1.5 to 10 mm. long, occasionally with 1 to 2 smaller auxiliary spines, at first dark brown, soon black, the white horny margin entire or rarely with small white teeth; scape 3 to 4 m. high, inflorescence dense; flowers cream-colored. July.

Eight rather well marked forms of *Agave victoriae-reginae* are described as follows:

Agave victoriae-reginae forma *typica*.

Rosette very leafy, leaves 10 to 15 cm. long, 3 to 4 cm. wide, abruptly rounded at the apex, terminal spine 2 to 5 mm. long.

Agave victoriae-reginae forma *dentata* Breitung, forma *nova*. A forma *typica* differt: foliorum parte media marginali aliquot dentibus brevibus albis retrorsis armata.

Distinguished from the typical form by having the middle of the leaf margin armed with several short, downward pointing white teeth.

Type No. 18161 deposited in Calif. Acad. Sciences, San Francisco.

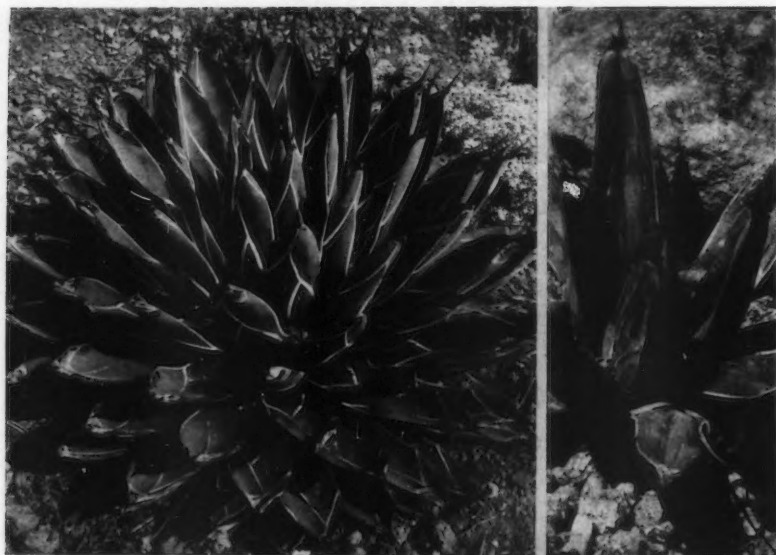


FIG. 22

Agave victoriae-reginae forma *nickelsii*. Left: grown in the Huntington Botanical Garden, San Marino, California. Right: *A. victoriae-reginae* forma *viridis*. Grown by Hubert Monmonier, Los Angeles, Calif., from seed collected in Mexico. Approx. $\frac{1}{3}$ natural size.

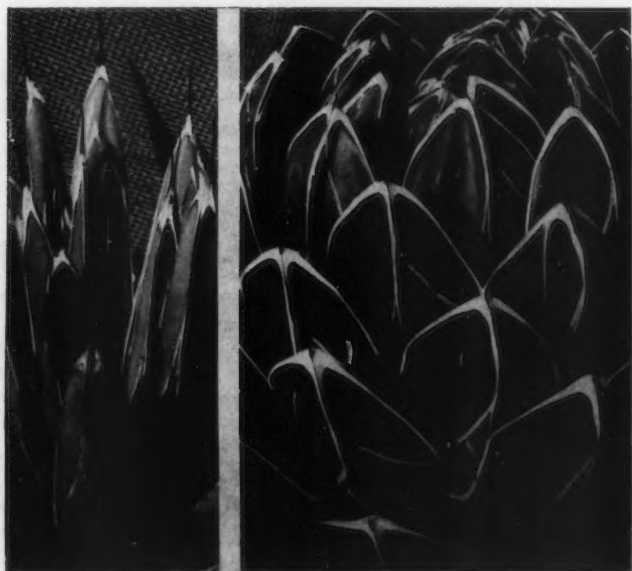


FIG. 23

Agave victoriae-reginae forma *longispina*. Left: grown by Hubert Monmonier, Los Angeles, Calif., from seed collected in Mexico. Approx. $\frac{1}{2}$ natural size. Right: *A. victoriae-reginae* forma *latifolia*. Grown by Hubert Monmonier, Los Angeles, Calif., from seed collected in Mexico. Approx. $\frac{1}{2}$ natural size.

Agave victoriae-reginae forma *nickelsii* (Hort. ex Rolland Gosselin) Trelease in Standley, Contrib. U. S. Nat. Herb. 23(1): 140, 1920.

A. nickelsii Hort. ex Rolland Gosselin, Rev. Hort. 1895: 575, 1895.

A. victoriae-reginae var. *laxior* Berger, Hort. Mortol 15: 364, 1912.

A. ferdinand-regis Berger, Die Agaven, 90, 1915.

Distinguished from the typical form by the fewer leaved, more open rosette; leaves acute from base to apex up to 22 cm. long; terminal spine 2 cm. long, usually with a pair of auxiliary short spines.

Agave victoriae-reginae forma *viridis* Breitung, forma *nova*: foliis omino viridibus, non albo-notatis.

The absence of white leaf markings distinguished this form.

Type No. 18162 deposited in Calif. Acad. Sciences, San Francisco.

Agave victoriae-reginae forma *longispina* Breitung, forma *nova*: foliis apice spinam perlongam tenuem nigram paulo torulosam, 2.5-3.5 cm. longam, basi 1.5 mm. latam ferentibus.

Distinguished by the unusually long, slender, terminal spine, 2.5 to 3.5 cm. long, black, slightly tortuose, 1.5 mm. broad at the base.

Type No. 18163 deposited in Calif. Acad. Sciences, San Francisco.

Agave victoriae-reginae forma *latifolia* Breitung, forma *nova*. Forma foliis perlatis, 4-6 cm. latis, insignis.

Distinguished by the unusually broad (4 to 6 cm.) leaves. The compact rosette composed of many broad, short, dark-green leaves with conspicuous white markings renders this as the most attractive and decorative form of *Agave victoriae-reginae*.

Type No. 18164 deposited in Calif. Acad. of Sciences, San Francisco.

Agave victoriae-reginae forma *ornata*, Breitung, forma *nova*: foliis plus minusve varie-



FIG. 24

Agave victoriae-reginae forma *ornata*. Left: grown by Hubert Monmonier, Los Angeles, Calif., from seed collected in Mexico. Approx. $\frac{2}{3}$ natural size. Right: *A. victoriae-reginae* forma *longifolia*. Grown by Hubert Monmonier, Los Angeles Calif., from seed collected in Mexico. Approx. $\frac{1}{3}$ natural size.

gatis, multas latas albas notationes ferentibus.

Agave victoriae-reginae forma *longifolia* Breitung, forma nova. A forma typica differt: foliis acuminatis perlongis, 2-3 dm. longis.

Distinguished by the long, acuminate leaves which are 2 to 3 dm. long.

Type No. 18165 deposited in Calif. Acad. Sciences, San Francisco.



FIG. 25 *Cryptocereus anthonyanus* was introduced by the author in 1950

CRYPTOCEREUS ANTHONYANUS

This monotypic genus is a recent introduction. The type locality is just north of Ocozocoautla, Chiapas, Mexico.

My experiences with *Cryptocereus*, in New York and in Mexico, indicate that it is one of the easier to grow of the epiphytic cacti. The known habitats are in the shade of rain forests at comparatively low altitudes, but under cultivation *Cryptocereus* tolerates a variety of temperature, light, and humidity conditions.

In the city of Oaxaca, with temperature and humidity considerably below those of its habitats, *Cryptocereus* grows well, and, where trained against a white wall in heavy shade, is extremely effective, both for the patterns made by the pads and for the deep, glossy green these assume.

The plant illustrated grows in the patio of Don Lisandro Maza, a mere "stone's throw" from the type locality. It would make a good story to say it was introduced to his patio from New York, and

this could well be true because *Cryptocereus* was introduced to cultivation in Ocozocoautla only after it had been described from a plant grown and flowered in the New York area.

Actually, the plant illustrated was started as a cutting brought from the forest. As first it grew on a porch pillar, then spread to the roof tiles in the shade of the guarumbo tree shown. Both tree and cactus continue to grow, but, as may be observed, the latter has far outgrown its shade. In Oaxaca, under these circumstances, I think the pads would burn. Here there is only a slight yellowing.

In a patch of rain forest, on a broken limestone formation north of Berriozabal, Chiapas, *Cryptocereus* commonly clammers over rocks. Under house culture it could make an effective hanging basket.

The flowers of *Cryptocereus* are so striking one could wish for them to be more frequent and less fugacious. A friend—not an early riser to be sure—once remarked, "it's too bad the flowers don't open wider."

T. MACDOUGALL

MARCH-APRIL 1960 OFFERING OF PLANTS
BY THE INTERNATIONAL SUCCULENT INSTITUTE, INC.

Please address all communications to the Secretary,
J. W. Dodson, 921 Murchison Dr., Millbrae, Calif.

ISI-127 *Sempervivum tectorum* var. *atlanticum* (Ball.) Hook. An African form of the well-known European Alpine species, with small, hairy, often pink-tinged leaves. An ideal, and probably hardy, rock-garden plant. UCBG 55.322, collected April 20, 1944 by Reid Moran (1947) at 1600m. alt. on steep rocky canyon side, 10 Km. S.E. of Asni, in the Grand Lutas, Morocco. \$1.00

ISI-158 *Crassula bolusii* Hook.f. A dainty dwarf species, with small greenish colored leaves, red underneath and spotted with brownish-red dots on the surface. It soon forms a cushion of striking appearance and is especially beautiful when covered with starry white flowers, produced in profusion in early summer. Kitching (12), in shade in moist sandy soil at south side of large rocks, farm "De Toorn", Graaff-Reinet Distr., South Africa. \$1.25

ISI-170 *Puya caerulea* Lindl. Earlier we offered seed of this hardy species, notable for its silver leaves and large green flowers, and well-suited for either rockery or large planter. We now offer seedlings of this same collection; see Cact.Succ.Journ.Am. 30: 157, 1958 for data and description. \$1.50

ISI-180 *Agave nizandensis* Cutak. A dwarf soon forming clumps, the leaves narrow, barely spined and with an attractive lighter stripe down the middle. This would make a good potted plant, or would thrive in the rock-garden if protected from frost. Photo: Cact.Succ.Journ.Am.23: 143, 1951. UCBG 58.1001, grown from seed collected in 1958 by T. MacDougall at the type locality, Nizanda, Oaxaca, Mexico. \$1.25

ISI-285 *Lenophyllum guttatum* Rose. A little-known member of the *Crassulaceae*, with leaves conspicuously brown-spotted. Growing less than 3 inches high, it is the best species of its genus and a fine plant for a collection of the smaller succulents. Photo: Cact.Succ.Journ.Am.24: 153, 1952. UCBG 50.1059, collected Nov. 1946 by Lefebure, 4 or 5 miles from Saltillo, Coahuila, on the road to Monterrey, Mexico, in full sun on a rocky slope. \$1.00

ISI-288 *Abromeitiella* sp. Here's a real novelty, a terrestrial bromeliad similar to *Dyckia* but with rosettes only an inch or two across, forming dense mats, and with the green flowers hardly emerging from the leaves instead of being on a long stalk. An excellent rockery plant, not damaged by frost. UCBG 53.1233, collected by Jose Piccardo at El Alisal, Argentina. \$1.00

ISI-290 *Maibuenia poeppigii* (Otto) Weber. This cactus is totally different from its relative, *Pereskia*, for it forms dense mats of thumb-like stems less than an inch high, and has short, cylindrical leaves and yellow flowers. Not recommended for pot-culture, this alpine species should be planted in the ground in half coarse sand, whereupon it flowers and grows normally despite (or because of) the rain and cold. UCBG 54.108, grown from seed collected by Dr. Edwyn Reed in 1954, at Polcura, North of San Rosendo, Prov. Nuble, Chile. \$1.00

ISI-309 *Rhipsalis wercklei* Berger. A pendent, rain-forest cactus with tape-like, or rarely trigonous stems, small, yellowish flowers and white fruits; a very rare species, seldom found in cultivation. UCBG 52.1079, collected by H. C. Lankester, 3500' alt., Navarro, Costa Rica. \$1.25

ISI-321 *Echeveria agavoides* var. nov. Soon to be published in Walther's revision of *Echeveria*, this is

much larger than the typical variety; the rosettes may reach a foot in diameter, but remain small if under-potted. The leaves though not margined with red, become suffused with a deep pinkish color in sunlight. A wonderful garden or specimen show plant. UCBG 50.677, collected by Eric Walther in the garden of C. Halbinger, Mexico City. \$1.75 and \$2.75

ISI-322 *Echeveria agavoides* var. *corderoi* (Morren) von Poelln. One of the best-looking *Echeverias*, this variety is noted for its heavily red-margined leaves. While a single specimen makes an excellent potted plant, it offsets readily, forming an impressive cluster suitable for landscaping, as it withstands light frosts. UCBG 59.428, imported from Mexico by Dr. Meredith Morgan. \$1.50 and \$2.50

ISI-331 *Echeveria craigiana* Walther. Not "just another *Echeveria*" but an outstanding addition to a collection. Its rosette is stemless and compact, the leaves highly succulent and of a peculiar ashy-brown which turns reddish in full sun: the flowers are bright red. In California gardens it looks especially fine tucked between rocks, while grown indoors it does best with strong light and little water. Photo: Cact.Succ.Journ.Am.24: 28, 1951; vol.26: 39, 1954. UCBG 51.1088, 6000' alt., collected by R. T. Craig and George Lindsay near the Barranca de Rio Urinque, Chihuahua, Mexico. \$1.75

ISI-332 *Haworthia ramosa* G.G.Smith. As indicated by the specific name, this peculiar species has long, branched stems, a unique occurrence in section *Obtusatae*. The soft, pale green leaves often turn pinkish in sunlight. This is the type collection by G. G. Smith (#3168) from near Woolridge, Peddie Distr., Cape Province, South Africa. Photo: Cact.Succ.Journ. Am.25: 33, 1953.

ISI-133 *Aloe somaliensis* Watson. This new introduction is small, stemless, slow growing and a very handsome species with heavily toothed, dark green, spotted leaves. Grown from seed collected Oct. 24, 1957, by P. R. O. Bally (#B11922) West of Borama, Borama Distr., Somaliland Protectorate, East Africa. \$2.25

ISI-334 *Aloe harlana* Reynolds. A recently published species and a worthwhile introduction to collections. The small stemless rosette of olive-green leaves is edged with brown spines: flowers red. Grown from seed collected Feb. 9, 1957, by P. R. O. Bally (#B10076) at Harla, Harar Prov., Ethiopia. \$2.00

ISI-336 *Monanthes brachycaulon* (Webb & Berth.) Lowe. A member of the *Crassulaceae*, the individual rosettes being less than an inch high, consist of minute, tightly packed leaves, of a pale yellowish-green and bear strangely constructed flowers. UCBG 54.1303, collected by E. Sventenius May 14, 1953, 100 m. alt., in rather shady moist rock-fissures, Gran Salvage Island, Canary Islands. \$1.25

ISI-338 *Echeveria simulans* Rose. An extremely fine, frost resistant species with compact rosettes of silvery leaves, ideal for planting between rocks or among steps. Differs from *E. elegans* in having larger, less proliferous offsets. UCBG 52.1875, from Victor Reiter, original collector unknown, determined by Walther. \$1.00

ISI-399 *Rebutia krainziana* Kessels. Distinct in the genus for its nearly spineless stems, this species also clusters freely and produces bright red flowers; one of the prettier *Rebutias* and easily kept in a small pot. UCBG 50.2175 propagated from the type plant from the Zurich Succulent Collection, originally col-

lected in Bolivia by F. Ritter. \$1.00

ISI-340 *Lobivia westii* Hutchins. The flowers of this recently described species are a fiery orange-red and more elongated than usual in *Lobivia*. It withstands much cold, being native to altitudes of about 11,000'. UCBG 36.1053, the type collection, collected by James West (#3741) in 1935, Coripacchi, between Andahuaylas and Argonia, Dept. Apurimac, Peru. Photo: Cact.Succ.Journ.Am.26: 81, 1954. \$1.50

ISI-341 *Disocactus quezaltecus* (Standl. & Meyerm.) Kimn. First published in a monotypic genus, *Bonifazia*, this is one of the most beautiful and ornamental epiphytic cacti of Central America, notable for its 3-inch flowers of a distinctive pale purple. Never before available to collectors, who should find it an attractive basket-plant. See Cact.Succ.Journ.Am. 31:138, 1959, for its only published illustration. UCBG 57.235, collected by C. K. Horich March 13, 1957, 1800-2100 m. alt., between Las Nubes and Mujulá, Dept. Quezaltenango, Guatemala. \$1.50

ISI-342 *Disocactus biformis* (Lindl.) Lindl. An epiphyte with *Rhipsalis*-like stems, and with large, half-expanded, brilliant red flowers and fruits resembling cranberries. Although long missing from cultivation, it has recently been re-collected. For an interesting account of its re-discovery, see Cact.Succ. Journ.Am. 31: 56-58, 1959. UCBG 57.244, collected by C. K. Horich, March 9, 1957, 1300 m. alt., gorge of Rio Goacalate, 6 km. South of Alotenango, Dept. Sacatepéquez, Guatemala. \$1.50

ISI-343 *Wilmattia minutiflora* (Britt. & Rose) Britt. & Rose. Although its stems seem to be those of a *Hylocereus* and the reddish flowers have the same large imbricate bracteoles, the flower is less than 2 inches long. A most peculiar, easily grown, vining cactus. UCBG 57.286, collected by C. K. Horich, March 1957, epiphytic, 240' alt., outskirts of Quirigua, Dept. Isabál, Guatemala. \$1.25

ISI-345 *Haworthia batesiana* Uitew. Forms mounds of small green rosettes, the leaves with net-like lines, but is easily kept as a single plant. Photo: Cact.Succ. Journ.Am., 26: 53, 1954. Collected by G. G. Smith (#6955) at the type locality, Valley of Desolation, Graaff-Reinet, Cape Province, South Africa. .75

ISI-346 *Haworthia maraisii* von Poelln. In Africa this choice member of the section *Retusae* grows in crevices of weathered slate. Because its leaves are blackish and have a sandpaper-like surface closely resembling the texture of the rock, it is difficult to find. In cultivation it does best when grown in considerable shade. Photo: Cact.Succ.Journ.Am. 12: 175, 1940. Collected by W. R. B. Marais near Swellendam, South Africa. \$1.50

ISI-347 *Haworthia reinwardtii* var. *tenuis* G. G. Smith. This is the slenderest member of the section *Coarctatae*. With age the inch-thick stems may reach a length of two feet, acquiring an odd, rope-like appearance. The leaves are nicely marked with rows of white tubercles. Collected July 1940, by G. G. Smith, (#3420) near Alexandria, Alexandria Distr., South Africa. \$1.25

ISI-348 *Epithelantha micromeris* (Engelm.) Weber ex Britt. & Rose. This great oddity among cacti is so closely covered with whitish spines that it resembles a golf-ball. From its top emerge small pink flowers and red, club-shaped fruits. Give good drainage and little water. Collected by W. H. Davis 7 miles South of Fort Stockton, Texas. 1/2 to 1" .75—1" or more \$1.25

ISI-349 *Ariocarpus fissuratus* (Engelm.) Schum. This famous native "Living Rock" has a flat, star-shaped body and a texture so similar to rough rock that it is difficult to find wild plants. The flowers are large and rose-colored. Collected by W. H. Davis,

3500' alt., 30 miles South of Alpine, Texas. 1" to 2" \$1.00—2" or more \$1.50

ISI-350 *Mammillaria lasiocantha* var. *denudata* Engelm. One of the smallest Mam's, its globular stems densely covered with white spines; petals white with a darker mid-stripe. Grow in a small pot and don't overwater. Collected by W. H. Davis on limestone hills 7 miles West of Fort Stockton, Texas. 1/2 to 1" .75—1" or more \$1.25

ISI-351 *Coryphantha vivipara* (Nutt.) Britt. & Rose. Forms clusters of globular stems clothed in whitish or pinkish spines, the attractive flowers with red, fringed petals. Collected by W. H. Davis along the upper Pedernales, 5 miles South of Fredericksburg, Texas. 1" to 2" \$1.00—2" or more \$1.25

ISI-357 *Mammillaria multiceps* Salm-Dyck A small clustering cactus, easily flowered and bearing profuse scarlet fruits. Should do well in-doors as it was collected in a tropical area in shade on moss-covered rock, between Antigua Morelos and Nuevo Morelos, San Luis Potosi, Mexico, by Bettencourt & Taylor (#43), February 1958. .75¢

ISI-354 *Melocactus maxonii* (Rose) Gürke. Though considered the gems of any collection, plants of this size are seldom available even to the advanced collector. The globose stem of this rare and beautiful species, is capped with a reddish and white cephalium (Turk's cap), from which emerge red flowers and pinkish colored clavate fruits. These specimens recently collected in Guatemala by M. Pacheco H., should be kept in shallow pots and planted in a soil of half sand, half leaf mold, with the base of the plant resting on a thin layer of sand. When re-rooted, water moderately in summer, but in winter keep dry and warm. We can offer only a few plants, but all have a cephalium. Plants are 5" to 6" dia., 5" to 7" tall, and weigh 3 to 4 pounds. \$6.50 and \$9.50

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1 lb. Pkg. Fertilizer No. 8, Hoof and Horn Meal Nitrogen, Potassium Sulfate and Superphosphate. . . \$1.65

INTERNATIONAL SUCCULENT INSTITUTE, INC.

921 Murchison Dr., Millbrae, California

DESERT FLOWERS UNDER GLASS

The story of my experiences and delight in growing and flowering Cacti and Succulents in a small glasshouse in Christchurch, New Zealand

By MARJORIE E. SHIELDS

CHAPTER 16

KLEINIAS or SENECIOS.

The next group is entirely different although again they are succulents. These are the Kleinias and Senecios amongst which we will find creepers, climbers and shrubs, both large and small; some deciduous, others evergreens, with leaves in all shapes, sizes and colours; and with flowers from insignificant groundsel to beautiful blooms reminiscent of cornflowers and others with true daisy blossoms. With a wealth of such diverse shapes and sizes Kleinias and Senecios deserve much more attention and study than they usually receive. They are now grouped together under the name of Senecio, the Latin name for Groundsel, meaning literally "old man." Why? Because in most of them when all the seeds have blown away, the bare top looks like a bald head, especially so when some of the seeds are still attached and hang around the bald top just like the little fringe of hair on an old man's head. As some are so well known under the old name of Kleinia, perhaps it would be better to refer to them as such. With few exceptions they are easily grown in a rich sandy soil, with plenty of water during the growing season. North and South Africa, the Canary Islands and the East Indies are their natural habitats. Only a few are represented in this collection, but these show what an interesting group it is.

Here is the best known one, *K. articulata*, the candle plant. You may well laugh! I had no idea it would do that when I planted it in the basket. The question now is how can I repot it? Impossible of course without breaking them off. It does look pretty though and shows what an attractive basket this plant can make. The flower is not very beautiful though, is it? But look at it through the magnifying glass. Quite a revelation! Now we can see it is composed of numerous florets, each a complete flower with calyx, petals, stamens, style and stigma lobes. The five recurved petals have the appearance of clear plastic. Protruding from the centre and falling to one side is the yellow style breaking into two curled stigma lobes. Clasp the style are the brown stamens, and one could be forgiven for thinking they were the style itself, so flat are they pressed against it; but when a floret is pulled to pieces the style will be found in the centre of the tube formed by the united stamens. Each little floret is surrounded by a brush of fine white silky hairs,

the modified calyx, to which is attached a single seed. When the flower fades these silky hairs develop considerably turning the flower head into a puff ball and when ripe act as parachutes, to carry away the seed. Looked at as a whole the flower head appears to be a jumble of recurved petals adorned with numerous stigma lobes curled over the top of the flower. All Kleinia flowers are made on the same principle but in various sizes.

Here is *K. pugniformis* a rather similar plant but with much more fleshy leaves and bigger flowers. This is also jointed but the segments instead of being long like candles are in assorted lengths, from round balls of all sizes to odd shaped pieces up to three inches long. The name means shaped like a fist. Both *K. articulata* and *K. pugniformis* lose their leaves at certain times of the year.

This delightful patch of blue is *K. repens*. Its thin, longish tapering, cylindrical blue leaves form a clump only a few inches high. As the name means creeping, the plant must be contained or it will become a weed, but grown in a pan it is worth retaining just for its beautiful coloring. The white flower is larger and more compact than *K. articulata*'s, the blue calyx adding to its attractiveness. This one with the dainty foliage is *K. speciosus*. Are you looking for its pot? It hasn't one. It is growing in the ground under the bench. When it reached the bench it found a crack and pushed itself through, and there it is high above the pots, quite happy with its large head of tiny cream flowers. These are very small, but when seen in a spray like this are showy and full of beauty, the name is no misstatement. The quaint leaves are cylindrical, like a stiletto, with two to three short prongs attached along its length. Young plants resemble small Christmas trees. If they would only stop most desirable plants, but unfortunately, like many other members of the family they attain a height of 5 ft. to 6 ft., most unsuitable for a small glasshouse.

On the archway is *K. radicans*, a trailer with string-like stems, and with short cylindrical growing when about a foot high they would be leaves sharply pointed at both ends, each leaf clearly marked along the top with a dark green stripe or window. It is not necessarily a hanging trailer, for if planted in the ground will quite happily clamber and trail over everything, living

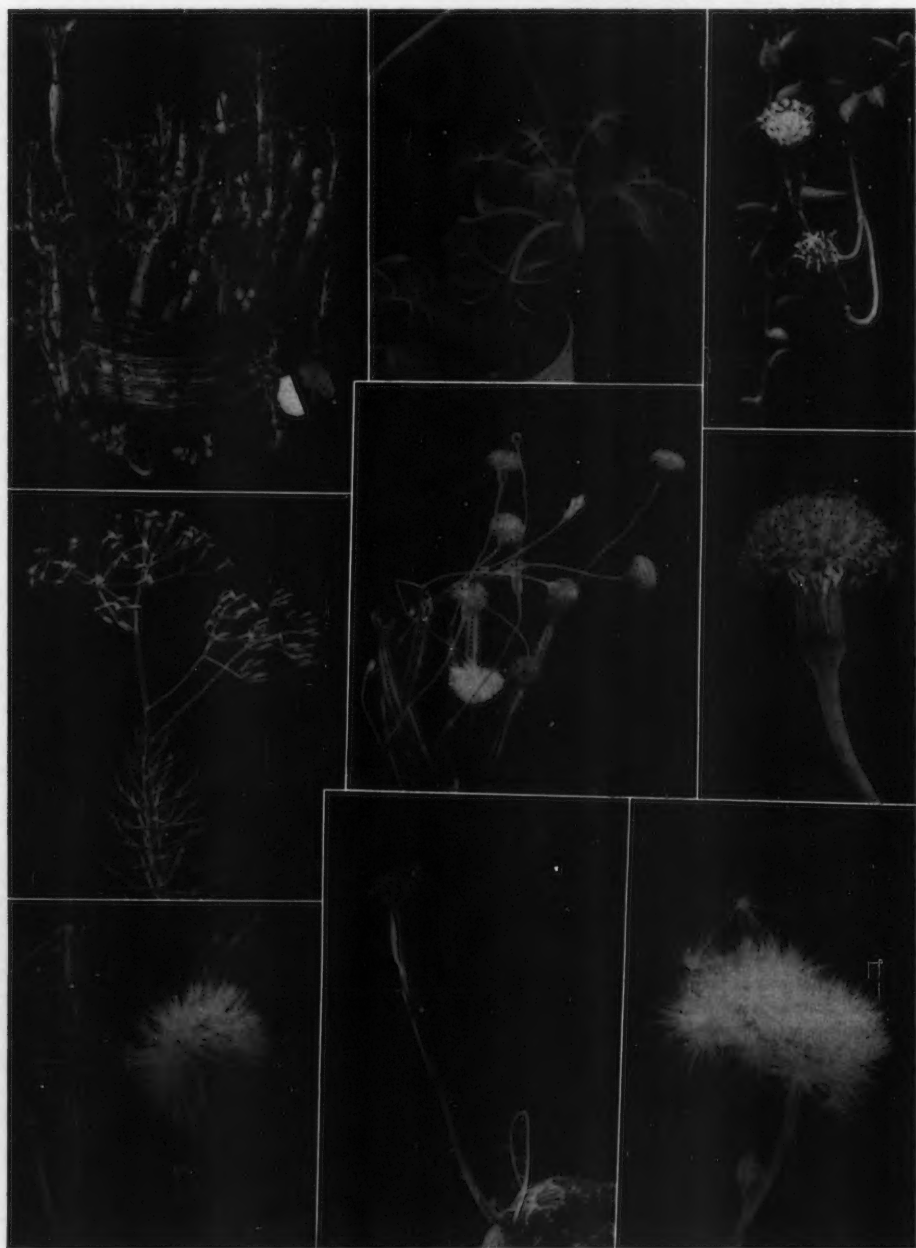


FIG. 26

Left to right. Top: *Kleinia articulata*, *K. pugniformis*, *K. radicans*. Center: *K. speciosus*, *Senecio stapeliaeformis*, flower of same. Bottom: Seed-head of *S. stapeliaeformis*, *Kleinia pendula*, seed-pod of same.

up to its name rooting at the nodes. The dainty blossoms, in pale lavender with deep purple stamens, are larger than others we have seen in the group so far. When they fade the fluffy seed heads remain on the plants for months and look most attractive.

K. pendula and *S. stapeliaeformis* are two that are sometimes sadly mixed. Seen side by side the difference is quite apparent. *K. pendula* like many *Kleinias*, has a round stem, but the stem of *S. stapeliaeformis* is angled and has little teeth like a *Stapelia*, therefore called "in the form of a *Stapelia*." It is beautifully marked with purple, red, grey and green markings and is altogether a most desirable plant. For not only is the plant handsome the flower is equally lovely. Branching from the base, each stem terminates in a long flower stalk, with a blossom, rather like a cornflower, both in size and shape, but more compact and in a glorious shade of apricot red with stigma lobes to match like a moth's antennae curling over it. The seed heads which follow are the size of dandelion puffballs and those forming late in the year remain intact for months. The plant is a picture. I have had it with many heads of bloom and seed heads at the same time, for it blossoms periodically from spring until late autumn. *K. pendula*'s stem grows to about 6 inches and then bends over until it again reaches the soil rerooting itself and throwing up more shoots at each rooting. That is why it is called *pendula*. Its common name, the inch worm plant, is equally appropriate. The flower on its long stalk is produced from the end of the stem before it returns to earth. It is a slightly smaller edition of *S. stapeliaeformis*, only in crimson. Because of its peculiar habit of growth it needs a pan to contain it. The first time *S. stapeliaeformis* flowered was in late autumn (April) and as it was flowering I thought it should have a drop of water although I had stopped watering the rest of the plants. That night we had a hard frost and in the morning the plant had collapsed. I picked the flower and dried it off and fortunately the seed was fertile. The plant I have here is one of those seedlings and I take good care now never to water it during late autumn or winter; it remains quite dry for about four months.

Most *Kleinias* come from South Africa, but *K. pendula* hails from Southern Arabia, while here is *K. petraeus* from Kenya and Tanganyika. A strange little hanging plant with upturned leaves. This has not the fleshy succulent stem of many *Kleinias* but is quite solid and hangs over the side of the pot to a depth of about 9 inches. Clothed with egg-shaped flat leaves standing perfectly erect packed flat against each other, it has the oddest appearance. The end of the stem breaks into little side branches which also turn

upright and from which the long flower stem is produced. This too stands erect and is graced with a flower similar to *K. pendula*'s, only in bright orange and with the florets more tightly packed together. It is most colorful as the leaves have a decided purple tinge which deepens during the winter months into a glorious metallic reddish purple with a bright green edge. The neatest plant in the glasshouse and during winter one of the most colorful.

Here is an interesting plant with a little story. It came to me with a number of other cuttings when an old collection was being cleaned up. I potted it and here it has been in the corner ever since. All visitors to the glasshouse were asked to name it, no one could. It grew a stem 16 inches long with a bunch of leaves towards the top, ending in a loose rosette. The leaves were soft green with a purplish red edge, the older leaves being highly coloured, especially on the back where the colour from the edges dyed them; young leaves having a slight dusting of powder. During winter it was a very colourful plant. At long last I noticed a flower stem arising from the centre of the rosette. This grew to a length of 18 inches and big fat buds appeared on the ends of the branching stem. These buds were very beautiful, being bright emerald green shading to purplish red. This colour also flushed the stem which was decorated at intervals with tiny brightly coloured leaves. Then the question arose as to what would be the colour of the flower. We all thought bright pink, because of the stem and calyx colouring. We also thought the plant may be a *Cotyledon*, because of the leaf shape and the pendulous buds. But, how wrong we were! When the calyx split, tiny orange petals uncurled between the purple and emerald green! More and more came and at last its identity was solved. It was a *Kleinia*! With its typical *Kleinia* perfume there was no mistaking it. But what a flower! The largest *Kleinia* flower I have ever seen and the colouring exotic. From the base of the calyx it measured 1½ inches with the spread of the florets also 1½ inches. Its name I discovered later is *K. amaniensis*. It evidently needs plenty of heat to bring it into blooming and from my experience a not too rich soil and a smallish pot. After putting on such a display I treated it with much more respect; potted it into a larger container with some good soil. Since then it has grown amazingly until it is a small shrub, but there have been no more flowers! It has been much too busy making growth. Nor have the leaves coloured, they are just pale green delicately powdered. That is why I say it needs growing hard, with little water and a smallish container.

Here on the bench is *K. tomentosa*, with its leaves so well wrapped in cotton wool, they look



FIG. 27

Left to right: *Kleinia petraeus*, *K. amaniensis*, flowers of same. Center: *K. tomentosa*, *Senecio scaposus*, flowers of same. Bottom: *S. cylindricus*, *Othonna crassifolia*, *Senecio tropaeolifolius*.

like long fat bobbins. This has not flowered yet. It is beautiful enough as it is. Another beauty is *Senecio scaposus*, thickly coated with white felt, which sometimes lifts to show the bright green underneath. But look! It has produced a long branching flower stem with a shining yellow daisy nodding from the end of each branch. These are real daisies with compact centres surrounded by a ring of yellow petals, each flower over an inch across. This blossom is quite different from any of the others we have seen in this group, and there are many *Senecios* with similar blooms but unfortunately not in this collection. Here is another in the form of a rosette, with bright green leaves looking more like a clump of chives than a glasshouse plant.

This is *S. cylindricus*. It has a fat bud on a 6 inch stem—just like an onion—and this has broken into a bright golden yellow flower. Each little floret with minute petals and with a very long style breaking into two curled stigma lobes waving over the top. It is very gay. The blossom is just a little smaller perhaps than those of *K. petraeus*.

The last one in the group is hanging in that green bucket. I thought it would surprise you, for anything less like a *Kleinia* than *K. tropaeolifolius* would be hard to find. There is nothing about it to give a clue to its identity, for it has thin wiry stems and ivy shaped leaves and looks as though it belongs to the nasturtium family—until it flowers. And once again the flower proves it a member of this versatile family. But what a flower! The most insignificant of them all. Worse even than groundsel, which is yellow, while this little one has practically no colour at all. What a peculiar tuberous root it has, rather like a half buried potato isn't it? This plant prefers shade.

Some *Senecios* have a daisy flower with a circle of bright petals surrounding a compact centre, like the daisies we find on our lawns. This is the type of flower *S. scaposus* will have eventually, as do many other not in this collection.

Also belonging to this Composite or Daisy Family is *Othonna crassifolia*, a hanging plant, thickly covered with small green jelly bean-like leaves, which squirt a jet of water when squeezed. These grow in clusters at the forks of this many branched creeper. The little yellow daisy flowers are very pretty and a plant in full flower makes quite a pleasing picture. Put it in the sun and the tips of the leaves will take on a reddish tint. That brings us to the end of them. But, what a family! Did you notice how their leaves differ? Let us take another quick look at them before we pass on to the next group. The simplest are these on *K. radicans*, small cylindrical, pointed at each end and with a window run-

ning along the top. Longer and fatter ones are found on *K. tomentosa*, like bobbins of wool; several have stiletto-like leaves, either singly or in clusters as in *S. scaposus*. *K. speciosus* also has a stiletto-like leaf but with prongs on either side; these prongs turn into veins adorned with frills as in *K. articulata* and the more fleshy ones of *K. pugniformis*. Then dispensing with the frills and flattening into an ivy leaf we have *K. tropaeolifolius*, these last three all being deciduous. *K. petraeus* prefers a simple oval leaf, as does *K. amaniensis* in a much larger size. Less than a dozen plants and each with a conspicuously different shaped leaf and all belonging to the same family. What a group. Who said *Kleinias* were not interesting?

FROM PHILADELPHIA

The January meeting of the Philadelphia Cactus & Succulent Society was held in the Morris Arboretum in Phila. Sunday January 10th. Plans were discussed for the Garden to be staged at the Philadelphia Flower Show in March. Tentative plans call for a Garden with proper settings of cacti and succulents for "Living with Cacti" the theme. The space allotted will be 20' by 10' and this will be ample for a small garden showing what beauty may be achieved by cactus and succulents. We were treated to a fine collection of slides of epiphyllums in bloom and the O's and A's were so many in appreciation of what the folks in California are able to do to produce such beautiful bloom on their orchid cactus. It is so difficult for us here in the East to have such glorious bloom in such profusion for our growing conditions are so difficult unless one has a glass house which can be devoted to their culture. And the temptation when one does have a glass house is to raise many varieties of plants and that is rather difficult on account of temperature and humidity. Desert cactus and succulents and Orchid Cactus just do not harmonize. But we still loved the slides and filled our hearts with the rare beauty.

Elsa Weber
6123 Cedar Avenue
Merchantville 8, New Jersey

EASIEST TO FLOWER—BIGGEST WASTE OF TIME

(See Journal Vol. XXX, No. 5, pg. 155)

Question 1) *Notocactus mammulosus*, which is rich blooming at an early age and keep on year after year with more and more rather attractive, large flowers. Succulents: most of the species of the *Faucaria* family, which form big clusters in a few years time and bloom in abundance during the fall and winter months.

Question 2) I would say, there is no such a thing as "wasting time" with any succulent or with any kind of plant life. We may not have the time to care for some of them or the space for others to let them grow as they are used to in their native habitat. Then we should pay our attention to other plants, more suitable to our particular set-up. But there is some beauty in any kind of plant, regardless if we are lucky enough to see the flowers or not. It is always a wonderful experience to observe the development of a plant, to see it growing and responding to our care.

WALTER GODDARD, Calif.

CACTUS AND SUCCULENT SOCIETY OF CALIFORNIA, INC.

The Cactus and Succulent Society of California held its first meeting of the year, second Sunday at one o'clock, in our permanent meeting place, the new Garden Center building in Lakeside Park, Oakland. Jack Daniels, head of the art department at San Mateo State College, gave an unusual and instructive program of arrangements using succulents in connection with rocks and driftwood in containers extremely well chosen.

After the business meeting, Professor Butterfield showed and discussed some of his hybrid Echeverias. Of the crenulated type 'Judy' and 'Mary Diane' were particularly attractive. A leaf with ruffled margins edged in red has been the goal in these crosses. Mr. Butterfield also showed several Echeverias with caruncles on the leaves. Among these were 'Edna Spencer' named for one of our charter members and some second and third generation crosses of 'Edna Spencer'. A succulent new to many of the members is a member of the gourd family *Xerosycios ferrieri*, a shrub becoming a vine eventually with attractive gray leaves.

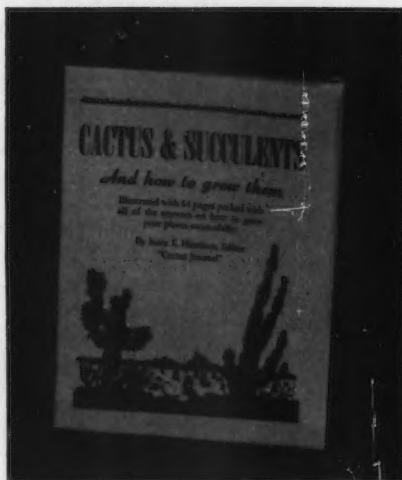
Mr. Tresler, alias Mr. Cactus, brought a tray of cactus with beautiful clean spines: *Parodia chrysanthion*, *Thelocactus goldii* and *Coryphantha pallida* were outstanding. An unnamed specimen of the *Urbina* group of Echeverias appealed to me especially. It had light, almost turquoise leaves tinged with pink. These leaves were three eighths of an inch thick making the whole look like a beautiful stone carving.

Our president, Dr. Dodson, showed a tray of Euphorbias imported from Africa, May 1959, from their respective type localities. *Euphorbia symmetrica*, a cylindrical plant, has often been mistaken for *Euphorbia obesa* which is globular. Male and female plants of each were shown. *Euphorbia valida*, *E. namibensis* were more colorful small plants.

Marafred Green, Affiliate Secretary

BIRD BOOKS

Small collection of bird books are offered for sale. Wm. Bright, 1939 Tulip Tree Lane, La Canada, Calif.



STEVE PHOTO

100,000 BOOKS

Since 1943 we have sold 100,000 copies of the booklet "Cactus and Succulents and How to Grow Them" by Scott E. Haselton. We believe this is the world's record for a cactus book. Many dealers use this book to answer the beginners' questions.



FIG. 28

Outdoor planting made by 14-year old Steven Guinness, Brookline, Mass.

QUESTIONS and ANSWERS

Conducted by
HARRY JOHNSON
Paramount, Calif.



Question: Three of my plants seem to be dying around the outside and some have black spots on them. Is it a disease or what is wrong?

Mrs. D. H. Roberts, Oregon.

Answer: It sounds as though your plants are in too close an atmosphere or that the room in which they are is being heated by an unvented gas flame or by a coal stove. Give them more fresh air and only a little water when they are quite dry. Too moist an atmosphere without a good circulation of air could be the cause of the black spots. The things you describe are due more to cultural fault than to disease. More fresh air and sunshine is a sovereign remedy for all such trouble.

Question: Why do my Stone Faces (Lithops) dry on top? Otherwise they are doing fine.

Mrs. O. Persons, Nebraska.

Answer: Lithops under cultivation should form only one pair of connate leaves a year. Last year's pair are slowly absorbed by the new pair. The new pair, at first very tiny, starts growth shortly after the plant flowers sometime between September and December in most species. They group slowly through the winter and in early spring can often be seen in the little aperture at the top through which the flower has pushed. When the growth has been completed, generally in April or May, the old pair are reduced to a papery covering which in nature may remain through their winter which is our summer as they come from south of the equator. The dry cap which is now paper-like may be removed so the beauty of the markings may be seen.

Question: I have lost three plants: *Cereus peruvianus monstuosus*, *Opuntia serpentina cristata*, *Echinopsis multiplex cristata* to a disease I cannot find in the books. A wet rot apparently starting at the base and working upward. Is it likely to jump to other plants?

Mrs. Sylvia B. Jacobs, Mass.

Answer: This is a common trouble where plants are over-watered. After replanting, allow the plants one or two months, depending on the weather, to start rooting in the new soil. Only dampen the soil, never soak it. Give plenty of fresh air and sunshine as long as the temperatures are above freezing. Over watering before plants are rooted well and lack of good air cir-

ulation and plenty of light are the bane of the inexperienced grower. Don't pamper your plants; they are tough and will take a lot of neglect better than they will over-solicitude.

Mrs. W. B. Ragsdale, Mo.

Question: Some hard red spots have appeared on my early flowering Christmas Cactus. When they are removed they leave a dent in the stem. The affected parts are turning yellow. Will a spray help?

Answer: This is not an insect pest or a disease but is probably due to cultural faults. The *Zygocactus* likes an airy location and a moist atmosphere. The compost should be damp but not kept continuously wet. The plants grow as epiphytes or on rocks at 3,000 feet elevation in the mountains near Rio de Janeiro, Brazil. At 3,000 feet they are on the lower edge of the cloud banks that hang on the slopes of the mountains in tropical regions. They don't seem to enjoy hot, dry weather.

Question: My Orchid Cactus failed to flower last year although it has grown very well. Will you give me the culture of these plants so that I may expect flowers.

Nellie E. Sargent, Indiana

Answer: Probably your plant is not getting enough sunlight and fresh air during the summer growing period. After danger of frost is over in late spring put the plants outside but protect from the full noonday sun to prevent scalding of the soft growth. Hanging the plants under a tree gives them about the proper conditions. They will take a fair amount of rain during the growing period if not over-potted or in too clayey a soil. Remember they do not grow on deserts but in forest regions in the tropics along with orchids and bromeliads generally up in the trees as epiphytes or on rocks or canyon walls. In winter they prefer to rest a little on the dry side and in not too warm a room: 50° to 60° is about right. Their flowering period is April and May.

Question: My White Christmas Cactus (*Zygocactus delicatus*) grew very well all summer and fall. In January I noticed it was drooping and when I took it out I saw that the roots had rotted away.

Mrs. N. Jendrzyzak, Wisconsin

Answer: Probably your soil had too much clay in it and that, with dry artificial heat and possibly coal gas, together with the lessened sun of winter was too much for it. While in eastern Canada last year I saw many kinds of very well grown cacti at the Botanic gardens in Montreal and also at the home greenhouse of one of our Society's old members, Laval Goulet, at Anos some 385 miles north west of Montreal. Many of their plants were grown in sphagnum moss

taken from the never ending bogs. The moss was dried and the cacti were potted directly in it and made excellent roots and growth. There was far less danger of overwatering and rotting. Christmas Cacti seemed to do very well in it. Their climatic conditions would be very much the same as our northern states. They were completely sold on the system and certainly the results were excellent.

Question: Will you please advise me if it is possible to obtain a permit to collect native cacti in California. I am not a dealer and want them only for my own collection.

Joyce P. Stoddard, California

Answer: So far as I know permits are not given except for special scientific purposes. Much of the lands in the west where cacti grow are owned by the State or Federal Government and are not under single control. On privately owned land of course the owner can allow you to collect plants. Actually few of our native cacti last long under cultivation unless grown from seed. The coastal areas of our state are too moist or cool for the true desert species. There are exceptions but generally speaking the colorful spined ones become dingy or within two or three years slowly shrivel or rot away.

Question: What is a safe spray to use of succulent plants to combat any disease. I have used Black Leaf "40" and Semesan. In powdered forms I have used charcoal, sulphur to forestall any difficulties.

Mrs. Sam J. Sheen, Texas

Answer: No spray is good for both insects and bacterial or fungus diseases. For Mealy bug, Aphis or spine Mealy Bug a spray containing rotenone or pyrethrum is effective. For scale insects I prefer an oil spray such as Volck to which I add a rotenone spray. Any plant with a glaucous covering such as *Echeveria elegans* will turn green if oil sprays are used. The newer type sprays such as Malathion are often deadly to various members of the Crassulaceae so do not use them on these plants. However they may safely be used on the Cactaceae and are very effective against Mealy Bug but not so good on scale. Sprays to be really effective should be used three times two or three weeks apart. Thus the eggs and crawlers are all accounted for.

Fungus diseases when present are generally the result of wrong culture. Give plants plenty of fresh air and reasonable amounts of sunshine and you will seldom see them. Rusts such as sometimes affect *Roechea falcata* (*Crassula falcata*) can be sprayed with a fungicide. Bacterial rots or Black Rot can be stopped only by cutting out the diseased areas. Often they follow the xylem or wood strands up the stem way past the visible rot and not much can be done except to wash the plant, cut off what you see and place the remainder in a dry, airy position hoping for the best. Generally if caught soon enough and if the plant is big enough the rotting will end the plant in a month or so can be re-rooted.

Please send your questions to Harry Johnson, Johnson Cactus Gardens, Paramount, California.



FIG. 29

Mr. Herman Jacobsen photographed by Dr. Otto Laporte in the greenhouses of the Botanical Gardens of the University of Kiel, Germany, in July 1958. The dominating plant is a fine specimen of *Cissus juttae*, from SW Africa, with leaves up to 24 inches long. The Kodachrome showed a large pile of pollen, on one of the leaves, which had dropped off the large inflorescence. In the foreground is *Euphorbia avasmontana*.

MONOGRAPH ON SUCCULENTS IN ENGLISH

The following insert, pages 49 to 52 inc., describe the English edition of "Handbook of Succulent Plants" (Other than cacti) by Herman Jacobsen. By the time

this Journal is received, all three volumes will be ready for shipment. Be sure to order from Abbey Garden Press.

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REVISED AND ENLARGED
HANDBOOK OF
SUCCULENT PLANTS

(Other than Cacti)

DESCRIPTIONS, SYNONYMS, AND CULTURAL DETAILS

HERMANN JACOBSEN

FOR the first time in the English language, the three volumes of this comprehensive reference are now made available to a wide public. The 1955 edition published in German has been revised and enlarged, with many new photographs, and considerable information and material not hitherto published.

The giant task of preparing these volumes has been carried out by a team of experts co-operating with Mr. *Jacobsen*. The authorised translation is by Dr. *Hildegard Raabe* of Kiel and this has been edited for English readers by Mr. *Gordon D. Rowley*. The proofs were read by Mr. *H. Herre*, Curator of the Botanic Garden, Stellenbosch, and Mr. *R. Ginns*, who were joined in the proof-reading of Volume III by Dr. *H. M. L. Bolus* formerly Hon. Curator of the Bolus Herbarium at Kirstenbosch.

VOLUME ONE

ABROMEITIELLA to EUPHORBIA

504 pages. 67 genera, 2377 species, subspecies, forms and hybrids are described; 1951 synonyms are mentioned with reference to the valid name. 601 illustrations.

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426 pages. 137 genera, 2521 species, subspecies, forms and hybrids are described; 1718 synonyms are mentioned, with reference to the valid name. 552 illustrations.

VOLUME THREE

MESEMBRYANTHEMUMS (FICOIDACEAE)

528 pages. 122 genera, 2528 species, subspecies and forms are described; 2137 synonyms are mentioned, with reference to the valid name. 464 illustrations and 3 maps.

Fig. 1008. *Sansevieria bahamensis*.

sharp spine, dark, nearly blackish-green, on both sides with lighter spots arranged in regular transverse bands.

Sansevieria stuckyi GONZALEZ, L.B. (Fig. 1009). — East Tropical Africa. — L. 2 distichously arranged, 20–30 cm. long, spreading, cylindrical, 10 mm. thick, tapering, green, mottled with light green, with two green longitudinal stripes 1 mm. broad.

Sansevieria thyrsiflora TRIN. (*Sansevieria guineensis* WILLD.). — Tropical Africa. — Rootstock thick, prostrate; L. 2–4, erect, flat, smooth, up to 45 cm. long, 8–9 cm. wide, lanceolate, tapering or obtuse, narrowed at the base into the petiole, on both sides with light green transverse bands and a narrow brownish-red edge; F. greenish-white, sweet-scented.

Sansevieria trifasciata PRIN. (Fig. 1009) (often called *Sansevieria zeylanica* in gardens). — Ceylon, E. India. — L. slightly concave, up to 135 cm. long, 6 cm. broad, sword-shaped, 8–15 on one shoot, with gray-white transverse bands and a broad green edge; F. scape with many bracts, P. 4 cm. long, greenish-white.

Sansevieria trifasciata var. *erubescens* WERT. — Similar to var. *laurentii*, but with still broader, lighter, nearly whitish longitudinal stripes. Slow growing.

Sansevieria trifasciata var. *laurentii* (WILLD.) N. E. BR. (Fig. 1007) (*Sansevieria laurentii* WILLD.). — Tropical Africa, Congo Region, near Steyterville. — Margins with yellow longitudinal stripes, whitish transverse bands very regular. Well worth cultivating.

Fig. 1009. Left: *Sansevieria stuckyi* GONZALEZ. Right: *Sansevieria trifasciata* PRIN.

Sansevieria zeylanica WILLD. — This name has been misused for several species. The true species is hardly known and probably not cultivated. Already WILLD. has confused it in his description with two other species (according to MAATSCH).

SARCOCAULON (DC.) SWEET

Family: *Gesneriaceae*

Occurrence: Angola, S. W. Africa to L. Namaqualand, coastal desert. Mostly low or small, intravascular shrubs, partly spiny and surrounded by a resinous coat; L. decumbent, of various sizes, soon deciduous, or pink. Peculiar plants which are leafless nearly for the whole year and

Fig. 1010. *Sarcocaulon burmannii* Photo: Prof. K. DINTER.

most extreme drought. Positive, warm house for succulents in porous soil. The plants should be only during the short growth which occurs in winter. The plants for several years.

Special literature: SIGMUND REISS, BOTANISCHE JAHRBUCH, 1903, p. 664–675: Die Gattung *Sarcocaulon* (DC.) SWEET.

Sarcocaulon burmannii (DC.) SWEET REISS (Fig. 1010, 1013) (*Monsiezia* DC.). — Bushmanland. — Dwarf shrub 1 m. high, grey-skinned; branches 10–15 cm. long, 1–1.5 mm. thick below, 1–1.5 mm. thick above, the leaf margin irregularly dentate, 10–15 mm. long, 10–13 mm. wide, the petioles 2 mm. long; pedicels 1–2.5 cm. petals about 20 mm. long, 15–18 mm. white to pale pink.

Sarcocaulon crassicaule REISS. — Cape Prov. L. Namaqualand, Pad Goodhouse-Steinling. Small shrub 20–30 cm. high, branches 15 cm. long, tuberculate, 15–20 mm. thick.

Fig. 238. *Caralluma lutea* N. E. BR. Typical form from Jencrust, Transvaal. Photo: Dr. H. LANG.

long, 10 mm. wide, elongate to elongate-spatulate, acute, margins recurved, three quarters of the length ciliate.

Caralluma mammillaris (L.) N. E. BR. (Fig. 240) (*Stapelia mammillaris* L., *St. pulchra* AIT., *Piscipulus pulchra* R. BR., *Piscipanthus mammillaris* G. DON., *Pectinaria mammillaris* SWARTZ, *Bumeroxia mammillaris* N. E. BR.). — Cape Prov., Worcester, Ceres, Clanwilliam and van Rhyndorp Division; L. Namaqualand: Richtersveld. — Stems branched, stout, 15 cm. and more high, 3 cm. thick, fresh green, irregularly

Fig. 239. *Caralluma maculata* N. E. BR. Photo: Dr. H. LANG.

Matjesfontein; Whitehill area; Prince Albert Div.; Willemshoof Div.; Calvinia; Ties. — From the base, compressed, ascending 3–4 m. high, 12–20 mm. thick, 4-angled, sides flat, little deepened, glabrous, dull dark violet, with acute teeth with white hard tips 4–5 mm. distant, 2–4 mm. long, F. 3–4 short, truncate conical, corolla yellowish to pink.

See the footnote for *Alce arborescens* var. *arborescens*.

THE AUTHOR
HERMANN
JACOBSEN



Born in Hamburg in 1898, Hermann Jacobsen has made a lifetime study of Succulents. He is a member of the International Organisation for Succulent Plant Research, and Curator of the Botanical Garden in Kiel, where he grows one of the world's foremost collections of Succulents. He has successfully cultivated many of the most difficult and rare types.

Mr. Jacobsen has been writing on the subject of succulents and their cultivation for many years, and some of his early work has been published both in Great Britain and in Germany. The present volumes, published for the first time in the English language, bring all his earlier work up-to-date, and with the vast amount of new material they form a complete encyclopaedia.

He has widely read and studied technical reference works on the subject, and his present volumes include a digest of them in non-technical terms. They record in simple language for the layman the principal features of each plant and give the nomenclature accurately and in accordance with current usage. The numerous synonyms are included as completely as possible for the sake of clarity, and in most cases the locations and habitats of the plants are given.

He has specialised in the cultivation of the Ficoidaceae Mesembryanthemums, which forms the subject of Vol. III. Specialists in this or any particular genus of Succulents will find here a storehouse of information.

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FERTILIZERS AND THE U.C. SOIL MIX

By J. W. Dodson

Some time has now passed since we first began to use the U. C. type soil mix, and some idea of the extent to which we have used this mix may be gained from the fact that we have now used some four tons of this material for growing succulent plants. Because we are growing a highly specialized family of plants under artificial conditions, it is most difficult to reproduce anything that even approaches (under cultivation) their natural conditions, for many reasons. For example, there is the South African group of succulents. Their summer corresponds to our winter, so that our climate is the exact reverse of theirs. Further, succulent plants come from all parts of the world, where not only climate, but altitude, water, mineral and food conditions vary to an amazing degree. Then too, there is very little known and it would take a lifetime to understand the plant pathology for each of the many families involved or to know the natural surroundings under which they originated and existed. To find a universally accepted medium in which to grow these plants and to work out a satisfactory method for handling them has been, and will continue to be, a challenging problem.

One problem, and a very serious one at that, has been the food supply (fertilizing) of the plants. Much remains to be done about this, but we have, we believe, solved this problem to some extent, at least so that our own plants show a good growth and vigor far superior to their culture without such fertilizing.

Before describing our experiences in regard to fertilizing our plants, it is perhaps in order to go into plant pathology to a small extent, and to understand a little of what we are attempting to achieve. As this is not a study in horticulture, we will be as brief as possible. Briefly then, a plant's requirements are:

1 **SUNLIGHT**—Animals through their digestive processes are able to secure the energy of sunlight that has already been stored in plants and to some extent in the tissues of other animals that they use as food. Plants, however, must secure this energy directly from sunlight itself. This energy which is used to convert the various substances required by the plant, into terms of plant growth, is secured through a process known as photosynthesis, roughly corresponding to the digestive action in animals.

2 **WATER**—is used in the production of carbohydrates which result in the cellulose (wood parts) of plants, as well as the starches and sugars found in the cell structure and helps to form the liquids or gasses necessary for all plant life.

3. **OXYGEN**—is used in combination with other elements to produce carbohydrates, that is the proteins needed by plants. Oxygen in water is a necessary combination for all essential elements, and as bacterial action cannot be produced except in the presence of oxygen, oxygen in the soil is also essential. This latter requirement is very probably why heavy compacted soils produce little plant growth.

4 **CARBON DIOXIDE**—provides the carbons used in making the proteins. It is absorbed mainly through the leafy structure and to some extent the stems of plants.

5 **TRACE ELEMENTS**—such as Manganese, Iron, Zinc, Copper, Boron, Molybdenum, are much like the vitamins required by animals.

6 **NITROGEN, PHOSPHORUS, POTASSIUM, SULPHUR**—are the raw products which are the source of protein and amino acids (food) which produce plant growth.

Of all the essentials for food manufacture of green plants, Nitrogen is next in importance to Hydrogen (in the water), Oxygen (in the water and air) and Carbon Dioxide (in the air) for plant growth. Nitrogen is needed in such quantities that it is more likely to become insufficient in quantity than other elements. The process of supplying Nitrogen and to a lesser extent, Potassium, Phosphorus and Sulphur, is known as fertilizing. Before we may supply fertilizers of the right kind, at the right time, and in the right amounts, it is of help to understand the process by which plants utilize these elements.

NITROGEN being of most importance we will consider this first. The atmosphere contains about 80% of gaseous Nitrogen, however, plants secure most of their Nitrogen from other sources, there being three main sources.

1—By electrical discharges in the atmosphere, such as lightning or when washed from the atmosphere by rain. The quantity from this source is exceedingly small.

2—By symbiotic bacterial action. Certain bacteria gain entrance to the roots of young plants of the *Legume* family (such as *peas, beans, clovers*) and also to other pod bearing shrubs and trees. These bacteria cause the formation of swellings or tubercles upon the roots. The bacteria living in these galls are able to fix Nitrogen from the air into organic Nitrogen compounds and the plant is able to use this Nitrogen or compounds resulting from its partial decomposition. The bacteria secures food from the plant on which it lives and the plant secures Nitrogen from the bacteria. Thus, both benefit by symbiosis, (that is, the living together of two kinds of organisms with a mutual benefit). This form of Nitrogen is confined to a relatively small group of plants.

3—Nitrification by bacteria in free soil. Certain bacteria have the power of combining the Nitrogen in the air, in the soil and in water, with other elements to build up Nitrogen compounds, later broken down into forms of Nitrates usable by plant life. This is an important function for we must remember that plants do not use any minerals or other elements directly from the soil, only solutions, gaseous vapors, and converted substances. This is an energy absorbing process and the necessary energy is secured by the bacteria from the oxidation of organic compounds, (the rotting of leaf mold and manure or decomposition and breakdown of other materials or dead organisms.) In this breakdown considerable ammonium is liberated into the soil. If excessive amounts of manures or other fertilizing compounds are used, the excess ammonium produced may severely damage or even kill the plant before it can be converted into a usable form. The ammonium in the soil is converted into usable Nitrogen in two steps:

1—First, bacteria of the genus *NITROSOMONAS* produce a form of ammonium nitrate, very little of which is usable by the plant.

2—Then, as rapidly as this ammonium nitrate is formed, it is converted into usable nitrate nitrogen by bacteria of the genus *NITROBACTER*.

Both kinds of these organisms always occur together, however, neither can survive in the presence of large quantities of carbohydrates, such as heavily manured or composted soils, until still other bacteria have fermented most of the organic material. The nitrifying bacteria are spore forming, do not stand high temperatures, (sterilizing) or many chemicals. They are not very active in a highly acid medium, nor are they active at low temperatures. Fertilizing during cold weather may, therefore, be injurious, at

best wasteful. The ammonium producing bacteria on the other hand, are not spore forming, and are quite hardy, and as they survive many of the conditions that inhibit the nitrifying bacteria, ammonium tends to accumulate. Fertilized soils usually produce ammonium in an unusable form for a week or ten days, then in a somewhat usable form of ammonium for about two weeks, after that, as both usable ammonium and nitrate forms. As ammonium and nitrogen compounds accumulate when soil is stored, plant injury may occur if soils are not used within a week or ten days after adding fertilizers. It is well to remember that nitrifying bacteria are most active and produce more Nitrogen under warm conditions, therefore, it is well to place newly potted plants to which a fertilizer has been given, in a cool and shady place for a time, until they may recover from the setback and be able to utilize the Nitrogen produced when they are placed in a warmer location.

The ideal solution for which we are striving, then, is a fertilizer that will provide usable Nitrogen for a varying period of time on a controlled basis, and one that will not introduce unwanted pathogens, organisms or salts. If fertility is low, as in the U.C. type soil mix, it should be a simple matter to add enough of the correct fertilizers to bring it up to the desired level. If, however, fertility is high, or unknown, (as with many other types of mixes), a problem will be created as to what and how much to add, which could only be solved by a complete analysis or growing trials.

LEAF-MOLD, MANURE, COMPOSTS, LOAMS: These materials have long been used not only as a source of humus, to lighten and aeriate soils, but during the process of decomposition, as a fertilizer. The drawback with using these materials are many and the results unpredictable, for their usability would depend upon the basic materials of which they are composed, the degree of decomposition, and to the actual growing conditions under which they are used, for there is certain to be an unknown level of fertility. These materials further often contain injurious salts, as well as molds, insects, nematodes, pathogens and other unwanted organisms. To heat sterilize these materials is a most difficult job and further, during heat sterilization processes build up that not only produce excess quantities of Nitrogen but many injurious products as well. During heat sterilizing necessary bacteria are killed, rendering these agents useless for a time.

FERTILIZERS AND THE U.C. TYPE SOIL MIX: Fertilizers fall into two classes, organic and inorganic. Organic compounds are comprised of the decomposing remains of animals and plants, such as manures, leaf-mold, fish emulsion, hoof and horn meal. Inorganic compounds are generally derived from minerals, coal tars, acid, and such combinations as the ammonium and urea-formaldehyde compounds.

FERTILIZERS SUPPLYING NITROGEN ONLY: Are particularly effective when used with the U.C. soil mix because they contain no humus nor do they contain other salts or minerals that would disturb the balance obtained by the Sand, Peat and I.S.I. Minerals¹ that make up the mix. Because the only appreciable amount of Nitrogen content in the basic U.C. mix is the small amount contained in the Potassium Nitrate, it will be used up within two or three weeks. Therefore, Nitrogen fertilizers should be added under the following conditions:

1—When roots begin to form on plants, cuttings, offsets, and other propagation.

2—To seedlings, two or three weeks after transplanting.

3—At the time of transplanting or repotting rooted plants.

4—To any plant that is in its growing season.

Fertilizers are usually applied in two forms, as a liquid or as a dry form of powder or granules. Usually, fertilizers applied as a "top dressing" (especially in a dry form), after planting, do not generally lead to injury from ammonium accumulations, because of the slow rate of ammonium penetration through the soil, as it does not readily move down past the surface layers of soil until broken down by micro-organisms. Thus, it is usually converted to usable Nitrates before it reaches the root area, even though the breakdown begins immediately upon being added to the soil. Again, fertilizers should, therefore, never be added to soils that are to be stored.

ORGANIC FERTILIZERS: High on the list of desirable organic fertilizers are Hoof and Horn Meal and Fish Emulsion. Hoof and Horn Meal is composed of the ground up hoofs and horns of animals. It breaks down rather slowly and thus supplies Nitrogen over a period of time. Depending upon the weather, in this fertilizer the Nitrogen is usually available within about one week, reaches a peak at about two to three weeks and is probably dissipated in from four to six weeks. Therefore, applications must be made about every six weeks during the growing season. Objections to its use are that it does have an odor, is not readily available everywhere, sometimes cakes and molds when applied as a top dressing and may attract insects.

In Fish Emulsion² the Nitrogen is available in relatively large amounts almost immediately, and is probably used up within two to three weeks, therefore, feedings are required weekly or perhaps every two weeks or so, depending upon the temperature and plant requirements. This fertilizer does especially well with *Epiphyllums* and other epiphytes during their flowering and growing season. It is excellent for succulent plants when used at the peak of their growing season or as a one time shot in addition to long time fertilizers, and it is easily applied to seedlings.

Fish Meal or Solids are now available, as lately a product³ compounded of Canadian Sphagnum Peat Moss with powder fine whale solubles and digested whole Whale Bone has been marketed. This may prove to be a valuable source of Nitrogen as it is claimed that water will not leach the nutrients which adhere to the peat via the glue in the Whale Bone and Baleen. We understand that commercial growers are using this product with considerable success. Unfortunately, our experiments with this source have been inconclusive to this date. Perhaps we may have more to report at a later date. We would appreciate hearing from anyone who has used this product.

INORGANIC FERTILIZERS are becoming more and more important, not only to nurserymen but to agriculture as well. In the past five years, world consumption of this type of fertilizer was more than doubled and organics account for over two-thirds of all the Nitrogen fertilizers used. For the plant grower they solve many problems for their ability to produce Nitrogen may be more easily controlled and the results more accurately predicted. As these are manu-

²Liquid Whale—by Acme Peat Products Ltd. #7 Road R.R. 2 Richmond, B.C. Canada. They will ship anywhere on the American Continent—write them if interested.

³Blue Whale by Acme Peat Products, Ltd., #7 Road RFD 2 Richmond, B.C. Canada. Write them for literature.

¹I.S.I. Minerals No. 1 and 2—International Succulent Institute, 921 Murchison Dr., Millbrae, California.

factured products, usually from coal tars, acids, minerals or petroleum, they contain few injurious salts and probably are free of pathogens and parasites. Inorganic fertilizers are of two groups. The liquid types are mostly ammonia solutions, and the dry solids (powders or granules) usually urea-formaldehyde compounds.

LIQUIDS: The liquid ammonia solutions while easy to use do have some drawbacks in that they are relatively fast acting. They have a short fertilizing life, and have a decided acid reaction so that when applied to container grown plants, especially succulents that cannot be thoroughly leached, they build up an acid soil reaction that may be injurious. If used perhaps once or twice a year at the peak of the growing season or as a booster to the dry types, they may be quite worth while. We have used Lawn Green¹ with excellent results and in many cases find it more satisfactory than some of the liquid organic types.

DRY SOLID TYPES: We have done a great deal of experimenting with urea-formaldehyde fertilizers this past year and have found them so satisfactory that the majority of our plants grown for I.S.I. are fertilized with this product, as the advantages are many. Our experiences would seem to indicate that one fertilizing per year is usually sufficient for most succulent plants. This is because recent research has made it possible to lock the urea compound in a plastic base that decomposes slowly over a period of about a year, to release Nitrogen on an even and controlled basis. Because this fertilizer has been so satisfactory the I.S.I.² has packaged it for distribution to growers of succulent and other container grown plants. Actual tests of the urea-formaldehyde compounds indicate that the Nitrogen converted to nitrate, reached a peak of about 55% to 60% in six months, but even after that about 40% was still available. As there is a definite dormant season of from one to four months with most succulent plants, one or two at the most, fertilizings per year should be satisfactory. In the past an objection to urea compounds has been that they have contained a highly injurious product called Biuret. It is only recently that research has been able to reduce the Biuret content to a point where it has practically no effect upon plant life. The urea-formaldehyde compound we are using (and which is supplied in I.S.I. Fertilizer #2 and #3) has less than 0.2% of Biuret.

FERTILIZING FOR DEPLETION OF MINERALS: After about two years of plant growth in the U.C. type of soil mix, it is to be expected that some other elements will have been depleted. It is, therefore, necessary to replace the minerals most commonly lost through leaching and plant growth. It is important that the correct proportions of the Nitrogen, Potassium, Sulphur, and Phosphorus be provided so as to keep salinity at a minimum and to supply a balanced amount of each element. Such fertilizers should be used every one or two years after potting or repotting and to be a complete fertilizer in a good formula would be about 44% Nitrogen compounds, 44% single Superphosphate and 12% Potassium Sulfate. Combination fertilizers are now available from I.S.I. in two types and such fertilizers will probably fulfill most requirements.

In one type the Nitrogen content is of a rather rapid Nitrogen source found in the Hoof and Horn

921 Murchison Dr., Millbrae, California. (see advt. on last page)

Meal which is available within three to four weeks and is to be used on quick growing plants such as *Epiphyllum*, *Rhipsalis*, *African Violets*, *Bromeliads*,³ etc. In the other type the Nitrogen content is available over a longer period of time and contains a urea-formaldehyde compound⁴ which is best for the slower growing plants.

POTASSIUM AND SULPHUR: Potassium is best supplied in the form of Potassium Sulfate for then we supply two important elements which are not only leached out of soils (as they are water soluble), but are used by the plants in a converted form. Micro-organisms help to liberate Potassium from the soil which when absorbed by the plants not only increases their powers of resistance to disease and parasites but increases the water storage which is especially necessary to succulent plants. Sulphur in the form of sulfates is part of the cell content. Sulphur undergoes microbial transformation similar to Nitrogen conversion, but instead of ammonium being produced, Hydrogen Sulfide is formed and further action by sulphur bacteria converts this to usable Sulfuric Acid.

PHOSPHORUS: Phosphates favor the production of flowers, fruit and seed, and further encourages the formation of roots (especially in cuttings) and of vegetative reproduction. It is best supplied in the form of Superphosphate, which usually contains some Calcium in the form of Gypsum to lessen acid reaction. Several bacteria and fungi often act to liberate usable Phosphorus. Cacti especially need large quantities of Potassium and Phosphorus though probably less Nitrogen.

GENERAL PRECAUTIONS: There are a few general precautions that should be observed in the use of fertilizers:

- 1—Use only on growing or rooted plants.
- 2—Use only the quantity recommended. Excess may damage or even kill plants.
- 3—Never add to soil that is to be stored.
- 4—Use soil within one week after combining with fertilizers.
- 5—Apply a fertilizer supplying Nitrogen *only*, to plants grown in U.C. type soil mix for the first one or two years of plant growth. (such as I.S.I. Fertilizer #2)
- 6—In the succeeding years (after first one or two years of plant growth), use a *combination* fertilizer containing Nitrogen, Potassium, Sulphur, and Phosphorus. (such as I.S.I. Fertilizers #3 and #8)

NOTE: All experiments with fertilizers were conducted with the U.C. type soil mix. However, the methods described should prove satisfactory with other types of soil mixes. Obviously the results we have obtained may not necessarily prove to be the same for everyone as conditions of temperature, soil, water, humidity, bacterial, parasitic, and pathogenic content of the mediums used will vary. All persons using these materials and procedures should do so in the interests of scientific research and we would be most happy to hear of their results.

¹I.S.I. Fertilizer #8—Hoof & Horn Meal, Potassium Sulfate and single Superphosphate for fast Nitrogen supply. (see advt. on last page)

²I.S.I. Fertilizer #3—Urea-formaldehyde, Potassium Sulfate and single Superphosphate—for prolonged Nitrogen supply. (see advt. on last page)

¹Lawn Green—17% Nitrogen, California Spray Products Co., Richmond, California.

²I.S.I. Fertilizer #2 Urea-Formaldehyde Compound 38% Nitrogen—International Succulent Institute,



FIG. 30

El Paso Cactus and Rock Club officers. Left to right: Mrs. R. H. Rodgers, Installing Officer; Clark Champie, President; Burt Gurney, Vice-president; Tony Evanoski, 2nd Vice-president; Walter Jakeman, Treasurer; Jesse Buehl, Secretary.

EL PASO CACTUS AND ROCK CLUB

By CLARK CHAMPIE

CACTUS BLOOMING SEASON STARTING

From the club "Bulletin"

The first cactus blooms should be already appearing on the early bloomers (*Echinomastus intertextus*). These early birds of the cactus world will continue to bloom right into early March when a number of other species will start. The sequence of blooms will then continue without a break until well into the summer.

The blooming characteristics of the El Paso cacti are as variable as the size and shape of the plants. Some of the tiny *Mammillarias* open their blooms only in the sunlight. Even if the sun goes under a cloud, they will close. On the other extreme are some of the *Echinocereus* group that stay open both day and night until they finally close for good. The blooms cover a wide range of colors through pinks, yellows, oranges, purples, lavenders and even white. The sizes vary from several inches across to as small as the eraser on a pencil.

El Paso cactophiles are pretty lucky people. All we have to do is go out and dig up some desired specimens of cactus plants, let them cure a few days in our almost ideal cactus climate and then stick them in the ground to root for themselves. Of course, we give them a little preferred treatment like a little more watering than Mother Nature is willing to allow. And we give them the exclusive use of the spot of soil we allot to them by removing any competition in the form of weeds in the better kept gardens.

Compare our situation with that in less favorable climates. A cactophile in England has amassed a collection of over 100 different kinds of *Opuntias* including numerous prickly pears, and has to keep all of them in greenhouses which he laboriously keeps warm with kerosene stoves.

If *Opuntias* (prickly pears and chollas) are counted, about 30 species of cacti grow in the El Paso area. Nearly all of these species can be found by experienced collectors on an extended field trip and even the newcomer could find a substantial number of different kinds of the spiny treasure to make a field trip an interesting experience.

However, it should be pointed out that the growing interest in native plants in El Paso is resulting in the large scale collecting of the nearer specimens so that

usually a lot of patience and legwork are necessary if certain species are to be removed from their present hiding places. In other words, only the well-hidden cactus plants in certain desirable species are still growing in their natural habitat near El Paso.

GLOCHIDS

Are you surprised by this statement—Texas has the largest number of species of cacti of any state in the United States? If so, then you probably thought that Arizona held that distinction, and with good reason. Not only are cacti in Arizona very abundant, they are mainly what you see over most of the state, but they are startling in their huge sizes. No wonder that both visitors and residents alike think of cacti when they think of Arizona.

In Texas, on the other hand, the different species of cacti are so small in most instances a tourist could easily drive completely across the state in any direction and never see a cactus—if he didn't leave his automobile—except for some of the prickly pears that do get large enough to see from the highway. Oh yes, he might see a few other species in some of the recently established roadside parks if he wasn't driving too fast. And, during the Spring blooming period, his eye might catch a glimpse of certain attractive blooms in the pasture lands on either side of the highway. But he wouldn't know what sort of plant they were on, in most cases, unless he stopped and climbed the fence to investigate.

The explanation is probably already apparent. In Arizona, while there are actually less species or kinds of cacti, these kinds are very abundant in number and, most important, very prominent because of the open, desert type of landscape. For miles, all you see is cactus and more cactus and soon your brain becomes intoxicated with the thought that "this is in fact THE cactus state of the United States." This abundance of the smaller species so prominent to the view together with the commanding presence of the spectacular giants (saguaro and organ pipe) leaves little doubt in your mind that you have seen a display of cacti that no other state can match. And, of course, you are correct.

But, Texas still has the largest number of species. They are just harder to find. Therefore, since they aren't usually seen, they are assumed not to exist by the average traveler and by many residents.

A REVISION OF BORZICACTUS

By MYRON KIMNACH

7. List of taxa

Presented below is an alphabetical list of genera and species referable to my concept of *Borzicactus*. Those recognized are printed in capitals with a complete sublisting of synonyms in italics. Each of the better-known synonyms is also listed separately in italics together with the species to which it is referred. Species referred to as insufficiently known are discussed in a sepa-

rate, concluding list. Necessarily brief comments, concerning variation, reasons for rejection of names, etc., are to be found under the names of recognized species and under the generic synonyms. I have also mentioned, when it seemed useful, the major differing characters of closely allied species.

Arequipa Britt. & Rose: BORZICACTUS

Because of their often globose stems, *Arequipa* and *Matucana* were placed by Britton and Rose in their subtribe *Echinocactinae*, but this was an artificial separation—most specimens eventually become columnar and the flowers are also similar to those of columnar *Borzicactinae*. The generic status of *Arequipa* seems not to have been questioned since its publication, but the shortly columnar stems, short nectary chamber, dry fruits and coarsely verrucose seed are too similar to those of such species as *Borzicactus haynei* and *B. aurantiacus* to justify this genus.

Arequipa aurantiaca: BORZICACTUS AURANTIACUS*Arequipa erectocylindrica*: BORZICACTUS LEUCOTRICHUS*Arequipa bempeliana*: BORZICACTUS LEUCOTRICHUS*Arequipa leucotricha*: BORZICACTUS LEUCOTRICHUS*Arequipa myriacantha*: BORZICACTUS AURANTIACUS*Arequipa retigii*: BORZICACTUS LEUCOTRICHUS*Arequipa soehrensii*: BORZICACTUS LEUCOTRICHUS*Arequipa varicolor*: see *Oreocereus varicolor* under insufficiently known species.*Arequipa weingartiana*: BORZICACTUS LEUCOTRICHUS*Arequipopsis* Kreuz. & Buin.: BORZICACTUS

Phillipi described the flowers of *Echinocactus (Arequipa) leucotrichus* in Latin as having "usually yellowish brown hairs" ("pilis"), but Oehme¹² mistranslated this into German as meaning "very numerous brown bristles." Reading this, Kreuzinger and Buining assumed that the type collection of *E. leucotrichus* from Chile had flowers with a spiny receptacle, and thereupon transferred three spineless-flowered, Peruvian variants of this species to *Arequipopsis*, a new genus segregated from *Arequipa*. Not only are the two inseparable as genera but I believe only one species is involved.

Bolivicereus: BORZICACTUS

This differs from *Borzicactus sensu* Backeberg by its shorter flowers, more oblique limb, narrower tepals and smaller fruits, and while it consists of a very distinct species it forms a remarkably indistinct genus. Cardenas did not mention how it differed from *Borzicactus*, saying only that it was intermediate to *Loxanthocereus* and *Cleistocactus*, but its expanded, zygomorphic limb makes necessary its inclusion in *Borzicactus*.

Bolivicereus samaipatanus: BORZICACTUS SAMAIPATANUS

BORZICACTUS Ricc., Boll. R. Ort. Bot. Palermo 8: 261, 1909.

Oreocereus (Berg.) Ricc., op. cit., 258.

Arequipa Britt. & Rose, Cact. 3: 100, 1922.

Matucana Britt. & Rose, op. cit., 102.

Morawetzia Back., Jahrb. Deutsch. Kakt.-Ges. 1: 73, 1936.

Seticereus Back., Kakt. Sukk. 1937: 37, 1937.

Clistanthocereus Back., Cact., Jahrb. Deutsch. Kakt.-Ges. May 1937: leaf 24, 1937.

Loxanthocereus Back., loc. cit.

Arequipopsis Kreuz. & Buin., Fedde, Rep. sp. nov. 50: 199, 1941.

Maritimocereus Akers, Succulenta 1950: 49, 1950.

Bolivicereus Card., Cact. Succ. Journ. Am. 23: 91, 1951.

Submatucana Back., Die Cact. 2: 1059, 1959.

Backeberg restricts this genus to *B. sepium* and its allies, which possess no character not found in many of his genera of *Borzicactinae*; however, he distinguishes it from *Clistanthocereus* by its more curved receptacle and more zygomorphic limb, and from *Loxanthocereus* by its hair-ring, differences which can hardly be used to separate genera. When defined to include all species having diurnal flowers with an expanded, more or less zygomorphic limb, *Borzicactus* becomes distinct, easily defined, useful, and is still a natural unit. *Oreocereus* was published simultaneously with *Borzicactus*, but it has been associated with only one species-group and is rejected in favor of the more widely applied name.

12. Cact., Jahrb. Deutsch. Kakt.-Ges. 1940: leaf 6, 1940.

BORZICACTUS ACANTHURUS (Vaup.) Britt. & Rose, Cact. 2: 161, 1920.*Cereus acanthurus* Vaup., Bot. Jahrb. 50: Beibl. 3: 13, 1913.*Cereus eriostichus* Werd. & Back., in Back., Neue Kakt.: 80, 1931.*Borzicactus eriostichus* Back., in Back. & Knuth, Kakt.-ABC: 192, 1935.*Borzicactus faustianus* Back., op. cit., 411.*Loxanthocereus acanthurus* Back., Cact., Jahrb. Deutsch. Kakt.-Ges. May 1937: leaf 24, 1937.*Loxanthocereus eriostichus* Back., Blätt. Kakt. 1937-11: unpgd., 1937.*Loxanthocereus faustianus* Back., Fedde, Rep. sp. nov. 51: 65, 1942.*Loxanthocereus keller-badensis* Back. & Krainz, Sukk., Jahrb. Schweiz. Kakt.-Ges. 2: 22, 1948.*Loxanthocereus acanthurus* var. *ferox* Back., Cact. Succ. Journ. Am. 23: 19, 1951.*Binghamia acanthura* Borg, Cacti: 185, 1951.*Binghamia eriosticha* Borg, loc. cit.*Loxanthocereus pullatus* Rauh & Back., Descr. Cact. Nov.: 14, 1956.*Loxanthocereus pullatus* var. *brevispinus* Rauh & Back., op. cit., 15.*Loxanthocereus pullatus* var. *fulviceps* Rauh & Back., loc. cit.*Loxanthocereus canetensis* Rauh & Back., op. cit., 16.*Loxanthocereus gracilispinus* Rauh & Back., loc. cit.*Loxanthocereus cantianensis* Rauh & Back., in Rauh, Beitr. Kenntn. peruan. Kakt.: 315, 1958.*Haageocereus faustianus* Ritt., Back. "neuer" peruan. Kakt.: 14, 1958.

The type locality of *Cereus acanthurus* is Matucana, Rio Rimac, Peru, and the type description is sufficiently detailed for comparison with recent species from the same area. The type locality of *B. eriostichus* is "above Matucana", and Backeberg¹¹ states that it and *B. acanthurus* are found at the same locality; it differs mainly in its more copious apical stem-hairs, a trivial character, for Backeberg¹¹ later remarked that some plants of *B. acanthurus* also had apical stem-hairs. *B. faustianus*, cited only as being from the Rio Rimac, differs in its longer or more numerous spines, while *L. keller-badensis*, also from an unknown locality along the Rio Rimac, differs mainly in its flowers having a purplish tinge, a frequent occurrence in many species of *Borzicactus* with usually red flowers. The remaining species cited above in synonymy grow in nearby river canyons north or south of the Rimac and differ only in having slightly more or less ribs or spines. At the U. C. Botanical Garden in Berkeley are at least five additional variants collected along the Rimac by Akers, Hutchison, and Johnson which are as distinct as any of the above published species. When only several of the published and unpublished forms are considered they hardly seem conspecific, but when all (or merely the published ones) are arranged in a morphological sequence there are no gaps wide enough to accommodate specific lines, and it seems inevitable that thorough collecting in the Rimac area will disclose further intergrades. Until field-work supports a contrary view, I think it best to consider *B. acanthurus* a polymorphic species for which a clear-cut specific concept must necessarily be wide. In this expanded sense *B. acanthurus* differs from *B. sextonianus* in its more erect growth, finer spination, more numerous ribs and a range restricted to central coastal Peru.

Borzicactus aequatorialis*: BORZICACTUS SEPIUM*BORZICACTUS AURANTIACUS** (Vaup.) Kimn. & Hutchis., Cact. Succ. Journ. Am. 29: 47, 1957.*Echinocactus aurantiacus* Vaup., Bot. Jahrb. 50: Beibl. 111: 23, 1913.*Echinocactus myriacanthus* Vaup., op. cit., 25.*Echinocactus weberbaueri* Vaup., op. cit., 26.*Arequipa myriacantha* Britt. & Rose, Cact. 3: 101, 1922.*Matucana weberbaueri* Back., Beitr. Sukk. 1939: 42, 1939.*Arequipa aurantiaca* Werd., Kakteenk. 5: 77, 1939.*Borzicactus calvescens* Kimn. & Hutchis., Cact. Succ. Journ. Am. 29: 112, 1957.*Matucana currundayensis* Ritt., Succulenta 1958: 139, 1958.*Matucana ritteri* Buin., op. cit. 1959: 2, 1959.*Submatucana aurantiaca* Back., Die Cact. 2: 1061, 1959.*Submatucana calvescens* Back., loc. cit.

In transferring this species to *Borzicactus* the above authors discussed a form, collected by Blossfeld, with a hair-ring and with wider tepals than those of the type; though reported from Sondorillo, Hutchison did not find it there in 1957 and it is probably from farther south. *M. currundayensis* differs in no important character from the type collection of *E. aurantiacus*, but in its often laterally compressed, less hirsute receptacle, lack of a hair-ring, and purple-tinged, orange tepals it is somewhat intermediate to *B. calvescens*, which grows a short distance east, and the latter, despite its somewhat shorter spination, therefore now seems too weak to maintain. *M. ritteri*, collected between the type localities of the latter two species, is distinct mainly in its flattened stems and thin-tubed flowers. These three fairly distinct variants occur in an area only fifty miles wide, and it can be imagined how many equally distinct forms are likely to be found in the much greater area to the north in which several collections of the *B. aurantiacus* complex have been made. *B. aurantiacus* is variable and it is useless to publish each form as a new species. The foregoing variants, from west of the Rio Marañon, Peru, have about 16 (12 to 22) ribs, and flowers ranging from orange to red, often tinged purplish. Two allied species are recorded from east of the Marañon, at Balsas, not far from the type locality of *B. aurantiacus*. *A. myriacanthus* has 26 ribs and slightly more hirsute, rose flowers. These differences are minor, for equivalent ones also occur among forms of *B. leucotrichus* and other species. *M. weberbaueri* seems closer allied to this alliance than to *B. haynei*, and is also, suspiciously, from Balsas, with 21 ribs and yellow, hairless flowers. Yellow is present near the tepal bases in all forms of *B. aurantiacus* and it may perhaps be the dominant floral color in some populations; the hairless receptacle is an equally weak character, for separate flowers on one plant of *B. calvescens* are as often completely hairless as they are hirsute. Consequently I do not see how *M. weberbaueri* can be upheld, though its re-collection may later show it to be more distinct than presently known. From this expanded concept

B. aurantiacus emerges as a polymorphic but distinct species differing from *B. haynei* in its few ribs, large podaria, brownish spination and usually hirsute flowers. Both species have subglobose stems, a short nectary chamber, dry, longitudinally dehiscent fruit and coarsely verrucose seed; both should be included in *Matucana* in any classification recognizing that genus, but Ritter's¹³ transfer of *B. aurantiacus* to *Matucana* is invalid because the basionym was not cited.

Borziacactus aurivillius: BORZICACTUS ICOSAGONUS

Borziacactus calvescens: BORZICACTUS AURANTIACUS

BORZICACTUS CELSIANUS (Lem. ex S.-D.) Kimn., *comb. nov.*

Pilocereus celsianus Lem. ex S.-D., *Cact. Hort. Dyck*. 1849: 185, 1850.

Pilocereus bruennowii Haage, in Först., *Handb. Cact. ed. 2*: 651, 1885.

Pilocereus celsianus var. *lanuginosior* S.-D., in Schum., *Gesamtb. Kakt.*: 180, 1897.

Pilocereus celsianus var. *williamsii* Schum., *loc. cit.*

Pilocereus celsianus var. *bruennowii* Schum., *loc. cit.*

Pilocereus foveolatus Lab., *Cat. Cels.*, 1858.

Pilocereus celsianus forma *aurata* Schum., *Gesamtb. Kakt.*: 180, 1897.

Cleistocactus celsianus Web., in Goss., *Bull. Mens. Soc. Nice* 44: 44, 1904.

Cereus celsianus Berg., *Rep. Mo. Bot. Gard.* 16: 64, 1905.

Oreocereus celsianus Ricc., *Boll. R. Ort. Palermo* 8: 259, 1909.

Oreocereus celsianus var. *bruennowii* Britt. & Rose, *Stand. Cycl. Hort. Bailey* 4: 2404, 1916.

Oreocereus neocelsianus Back., *Des. Pl. Life* 21: 6, 1949.

Oreocereus maximus Back., *op. cit.*, 8.

Backeberg contends that Salm-Dyck's description of *O. celsianus* referred equally to *O. trollii* and that neither can be designated as the type; following Art. 65 and 66 of the Code of 1956 he has re-named the former species *O. neocelsianus*. This is a highly unnecessary procedure, for Salm-Dyck did not give an exact Bolivian locality for the species and it cannot be known whether the small forms he mentions were young plants of *O. celsianus* or mature specimens of *O. trollii*; neither has the name *O. celsianus* been "used in different senses and so has become a long-persistent source of error," as it is stated in the Code. In *Borziacactus B. celsianus* is distinct by its tall, very thick stems, few branches, prominent podaria, thick but short spines and coarse stem-hairs. A taller, thicker stemmed form was quite unnecessarily published as *O. maximus*. The photos in Britton and Rose,² supposedly of *O. celsianus*, are actually of *O. hendriksenianus*, and their description is of both species and *O. fossulatus* as well, for they knew this group imperfectly.

Borziacactus decumbens (Vaup.) Britt. & Rose: HAAGEOCEREUS DECUMBENS (Vaup.) Back.

BORZICACTUS DOELZIANUS (Back.) Kimn., *comb. nov.*

Morawetzia doelziana Back., *Jahrb. Deutsch. Kakt.-Ges.* 1: 73, 1936.

Oreocereus doelzianus Borg, *Cacti*: 115, 1937.

Morawetzia doelziana var. *calva* Rauh & Back., in Back., *Descr. Cact. Nov.*: 18, 1956.

This species varies in density of stem-hairs and coarseness of spination. Hutchison informs me that the hairless var. *calva* forms a distinct population but I do not find its differences impressive. *B. doelzianus* differs from *B. hendriksenianus* and *B. fossulatus* in its short, narrow stems, thinner spination, thickened, spiny, floriferous stem-apices, and in having at the base of the lowermost filaments a ring of spur-like structures, presumably the remnants of an obsolescent whorl of stamens.

Borziacactus eriotrichus: BORZICACTUS ACANTHURUS

Borziacactus faustianus: BORZICACTUS ACANTHURUS

BORZICACTUS FIELDIANUS Britt. & Rose, *Cact.* 4: 278, 1923.

Clistanthocereus fieldianus Back., *Cact.*, *Jahrb. Deutsch. Kakt.-Ges.* May 1937: sheet 24, 1937.

Borziacactus tessellatus Akers & Buin., *Succulenta* 1954: 81, 1954.

Clistanthocereus tessellatus Back., *Die Cact.* 2: 939, 1959.

Although a floral hair-ring was not mentioned in the original description of this species, Rauh collected flowers containing a well-developed hair-ring, and Johnson informs me that some of the flowers collected by him in Peru had a few rudimentary hairs. However, Akers collected (#301) what is unquestionably this species 10 miles north of the type locality, Huaraz, and the flowers on our plant of this collection completely lack a hair-ring. The lowest bracteole-apices are often hardened, flattened and brownish and may have been mistaken by Rauh⁹ for spine-like hairs. *B. tessellatus* differs from *B. fieldianus* in its lighter green stems, larger and flatter podaria, and in its usually single central spine. In species with few, wide ribs such differences are more conspicuous, but not necessarily more important, than in species with many narrow ribs; if these differences inadequately distinguish segregates of *B. aurantiacus*, for example, they also seem inadequate for recognizing *B. tessellatus*. In addition, its flowers hardly differ from those of *B. fieldianus*. The stems of *B. fieldianus* (including *B. tessellatus*) resemble those of *B. sulcifer*, but are usually erect and light or dark green, instead of prostrate and grey-green. These two species are more distinct in their flowers, those of *B. fieldianus* being nearly straight, not narrowed above the pericarpel, with a less pronounced zygomorphic limb and a short nectary chamber. *B. fieldianus* seems closest allied to *B. sepium*, differing mainly in its more arborescent growth, wider, flatter floral podaria and yellow anthers.

BORZICACTUS FOSSULATUS (Lab.) Kimn., *comb. nov.*

Pilocereus fossulatus Lab., *Rev. Hort.* 4: 24, 1855.

Pilocereus fossulatus var. *gracilis* Rümpl., in Först., *Handb. Cact. ed. 2*: 661, 1885.

Pilocereus fossulatus var. *pilosior* Rümpl., *loc. cit.*

?*Pilocereus celsianus* var. *gracilior* Schum., *Gesamtb. Kakt.*: 180, 1897.

Oreocereus fossilatus Back., Kakteen-freund 3: 122, 1934.

?*Oreocereus fossilatus* var. *gracilior* Back., Die Cact. 2: 1032, 1959.

The var. *gracilior* of *O. celsianus* was so poorly described that it cannot be known whether it really belongs with *O. fossilatus*, to which Backeberg has transferred it. Variation in *B. fossilatus* occurs mainly in spine length and color and none of the varieties are usually upheld. The species differs from *B. hendriksenianus* in its much taller growth, higher level of branching, thinner stems, shorter and thinner spines, and less hirsute flowers with a laterally wrinkled tube and brownish rose tepals; intergradation has not been recorded. *B. fossilatus* and *B. celsianus* have similar flowers, but the latter has much thicker stems and coarser spines.

(To be continued)

SPOTLIGHT ON ROUND ROBINS

Robins are surely growing! Several will be on the wing before this is in print. They are: Window Sill Robin No. 2, Aloes, Yuccas and Agaves Robin and the Epiphyte Robin (all rain forest plants except Epiphyllums), all of which need two or three additional members. The Mammillaria Robin, for members in this country only, has three members and more would be most welcome. If it in any way resembles the International one it ought to be a very excellent robin indeed. Besides this there is the Stapeliad Robin with two members at present and awaiting others to join it. The robin covers the whole Stapeliad group and includes the unusual as well as the old familiar ones. Finally there is the International Mesemb Robin which includes so many fascinating plants from Acrodon to Trichodiadema. Two members are on its list now and I hope four or five more will be attracted to belong. If I haven't mentioned a robin you are especially interested in, let me know what it is and perhaps others will be glad to join it with you.

The newest members I am happy to welcome are: Mr. John M. Riley, St. Petersburg, Florida; Mr. Franklin D. Crosby, Malibu, California; Mrs. E. M. Baxter, Manteca, California.

Turning now to the robin activities in C. & S. Robin No. 7, an enthusiastic member, Roger Jensen in Minnesota, writes, "The biggest thrill to me is during May and June when all the plants start their new growth. It is a beautiful sight to go to the greenhouse some evening about 11 P.M. and see seven or eight Echinopsis all opening up with from two to seven blossoms on each plant in shades of lavender, rose, pink and white, and with flowers from 2" to 7½" across, all sitting atop those beautiful long hairy tubes. I have eight Paramount Hybrids—an orange, red, tangerine, Peach Monarch, Sunset, Kate Nalher, Red Meteor, and Salmon Queen. They all have beautifully shaped flowers with twenty or more layers of petals, some ruffled, some smooth, and the throats all have a circle of thick yellow stamens which are so pretty. The Orange Paramount had sixteen blooms open at one time. It just took your breath away". He also mentions his Parodias, which "come into bloom in April with their crowns of yellow, orange and red blossoms," adding, "My Parodias are now all near a foot tall. One of them, *P. aureispina* (Tom Thumb) has a whole ring of plantlets around it."

With such remarkable success, the inevitable question on everyone's mind is, "What sort of soil mix does he use", and very happily he tells, "I use a soil mixture of ½ good rich, medium, black loam, ⅓ dark brown, well rotted cow manure (ten or more years old) and ⅓ good, rich oakleaf mold to which is added Harry Johnson's Soil Conditioner, about 1 level teaspoonful to a 6" pot, well mixed in. This gives the trace minerals almost all soils are short of. Sand is medium in texture and makes up for ¼ to 1/10th of the mixture, depending on the plants to be planted in it. For *Hyloteceae*, *Selenicereae*, *Eriocerei*, *Epiphyllums*, etc. I mix a bag of "Black

Magic" potting mix into the soil. It is a very porous—spongy brown-looking mixture with sponge rock mixed with it. It makes a beautiful soil for epiphyte-cacti (for me anyway) when mixed with the above mentioned soil mixture. I mix about three bags of it to about five gallons of the other soil."

In C. & S. Robin No. 10, Thelma Simmons in Texas, has added a note in regard to Echinopsis or Easter lily cactus when she quoted from the Amateur Bulletin part of an article by W. Taylor Marshall, who wrote, "If you have failed to get flowers, try a loose, rich soil and full sunlight and plenty of water in warm weather and you will be delighted with the results." He also said you do not have to remove the offsets to have bloom. Thelma also wrote of the way she interested her Garden Club in her succulent plants when she said, "When I went into the club I didn't have anything except cacti and succulents to use for horticultural exhibits, so I took a plant along every time. Soon they began to notice them and we would discuss cacti and succulents during the social hour. Then several asked me where to buy them and now there are a lot of members displaying their cacti."

Leslie F. Tookey, in the Rare Cacti and Crests Robin, writes from England, "Of the lesser known cacti I have, *Coloradoa mesae* verdae, *Copiapoa nigricans*, *Toumeyia papyracantha*, *Strombocacti*, *Ariocarpus* of all species, *Aztekium*, *Pelecyporphas*, *Solisias*, have all settled down and flowered well, in most cases set seed. I find the imported plants are easy to establish if one does not fuss over them. I root all mine in a mixture of equal parts peat and coarse grit, just kept moist in concrete pans about a foot square and about 3" deep. They stay in these for a season, in the following spring they are potted up or bedded out and believe me, the root system is amazing. Plants that are described by the experts as having weak root systems, "best grafted", are difficult to get into a pot comparable with the size of the plant. For instance, *Solisias*—a good specimen of which would be about like a golf ball, made roots which would not go in a 5" pan. If one can build a good root system then the plant should not collapse in a year or two as often stated in books." Bea Hanson, in the same robin but from New Zealand, mentions her crests which she says "are not many but nice ones—*Opuntia cylindrica*, *Mammillaria painteri*, which flowers well, *Notocactus scopae* (grafted), *Neolloydia horripila* (grafted), *Mammillaria geminispinia*, *Echinocactus grusonii*, a two headed plant, one head of which decided to crest so I took it off the normal one. It is very slow growing, though a nice crest. Here we try to grow all our crests on their own roots and once they are established there seems nothing to stop them. Crests are very difficult to obtain here and if any are ever sold they charge terrific prices for them." Mildred Wellbaum from Oregon, also from this robin, says, "I have about thirty crests, many from Mexico. Some are grafted but most are on their own roots which I prefer. I find the stock does not support the graft when it gets heavy. One of the

nicest crests I have is *Lobivia famatimensis nigra*. This bloomed well for me this year including crested blossoms. Another one is *Rathbunia alamosensis* which was yellow-looking when I got it and quite sickly. I had no idea as to the trouble but since we

have acid soil here, I tried gypsum and lime in the soil. It is now green and growing beautifully. I am interested in the article in the *Australian Journal* which says, "Desert cacti take a pH of 7.5 and acid

Continued on page 68



FIG. 31

Dr. and Mrs. Franz Buxbaum photographed by Mrs. Morton Spielman in Judenberg, Austria, October 4, 1958.

BOOK REVIEW

"Cactus Culture Based on Biology", by Franz Buxbaum; 217 + x pp., 40 pp. photos, 12 pp. color plates; Blandford Press, London, 1958; price \$5.75. Translated from the German by Vera Higgins. (Available from Abbey Garden Press.)

Dr. Buxbaum, Dozent of the University of Graz, Austria, and an eminent authority on the morphology of cacti, is ably qualified to treat his subject, and he has brought to it, with care, wit and good taste, his long professional experience in chemistry and botany.

This well-planned and authoritative text contains 13 chapters on all phases of the hobby of growing cacti. After a brief introduction and several remarks "On Cactus Collecting," the author summarizes the "Geography and Climate of the Cactus Countries." He proceeds, then, to analyze "The Cultivation of Cacti Based on Biological Principles," treating all aspects of the environment—light, soil, fertilizers, containers, moisture; he concludes this section with a discourse on "Winter Quarters." A special chapter is devoted to "Cultivation of Epiphytic Cacti" and others to "Seed-Raising," "Propagations by Cuttings," "Imported Plants," "Grafting," "Pests and Diseases," and "Calendar of Work." Pages 114 to 124 are devoted to "Taxonomy and Nomenclature," and the remainder of the book to "Descriptions of Genera (Arranged Alphabetically)." The book closes with a 6 page index and a series of 7 maps by the aid of which the reader may find the principal subdivisions, mentioned in the book, of the countries in which cacti are native.

The topics are discussed in a style which is both popular and lucid, and the sequence of presentation of the subject matter is excellent. Readers would be advised, for a first reading, to start at the beginning, for much of the later material has been developed from earlier discussions.

This book contains the first summary of all of Bux-

baum's views about the taxonomy of this taxonomically difficult family, as of 1958. Knowledge of morphology of cacti is increasing at such a rapid pace as a result of recent research that it can be anticipated that many changes in the positions of genera with relation to one-another, will take place in the future. It is refreshing to peruse a work, for a change, in which a number of cactus genera are reduced, and others questioned. Buxbaum does not hesitate to say "I don't know" in reference to the status of many genera. With good perspective and good humor, he advises that "anyone who thinks this is all too silly should throw all his labels away and just enjoy his plants."

The descriptions of the genera, Chapter 13, comprises about half of the book. Only the more important genera are treated in any detail, with a brief description, range, and cultural notes. Sometimes species are listed. It is of special interest to note that certain smaller cactus genera are not mentioned in this chapter (*Arequipa*, *Matucana*, *Thrixanthocereus*, etc.). It is perhaps not entirely coincidental that most of these omitted genera do not seem sufficiently distinct to warrant generic status.

While it is perhaps debatable whether the recommended technics for growing certain cacti are the best for all collectors in all parts of the world, there is little question that variations in culture can be contrived by any person with special growing problems who has read and understood this book.

The book would have been considerably improved by the addition of a chapter on the popular and technical literature about this family, and, in particular, by a list of the many specialty periodicals currently being published. Nevertheless it is the finest and most authoritative introduction to the subject of cactus culture that I have seen, of worth both to beginners and advanced students.

P. C. HUTCHISON

Icones Plantarum Succulentarum

19. *Adromischus pauciflorus*, sp. nov.

By P. C. HUTCHISON¹

The species described below as new was first described and figured by Karl von Poellnitz as *Adromischus nanus* (N. E. Br.) Poelln.² The material which Poellnitz examined was from Sendlingsdrift, 98 miles south of Aus in southern South-West Africa, *Triebner 1318*. C. A. Smith³ pointed out that the true *Adromischus nanus* was an entirely different species from that treated by Poellnitz, and he provided an illustration and description of it, together with citation of a number of localities, all in eastern Transvaal. Smith's interpretation of *A. nanus* was accepted by Poellnitz, who then renamed the plant he had figured and described in *Desert Plant Life* as *Adromischus casmibianus* Poellnitz, referring to his earlier description, but without giving a Latin diagnosis. This new name is therefore illegitimate, as it has not been validly published under Article 34 of the International Code of Botanical Nomenclature, 1956. Poellnitz's name could be legitimized here, but it is rejected in accordance with Recommendation 45B of the Code. In preference to renaming this plant in honor of C. A. Smith, who in a letter has expressed his displeasure of Poellnitz's having done so, a new name has been chosen.

All material examined by me has been collected by Mr. Harry Hall of the National Botanic Gardens, Kirstenbosch, Newlands, near Cape Town, who has discovered many new species during his explorations in South Africa. The collections are from Kinderle, near Steinkopf, in the Richtersveld, Namaqualand. Hall forwarded pickled material of five plants in flower (all one-flowered) in 1957, and an excellent sketch, and in 1958 responded to my request for additional information about the species with the following comments:

"It does not seem to occur where there is any decent depth of soil, always in crevices or on very shallow layers over solid rock. Kinderle is about seven miles northeast of Steinkopf and roughly the same area as 758/55. It might well occur on the warmer sides of many other hills in that very hilly area, especially near the summits, for it does not occur down near the plains. Such small types are readily overlooked when tramping around and there are always, in that very interesting region, so many other plant forms to

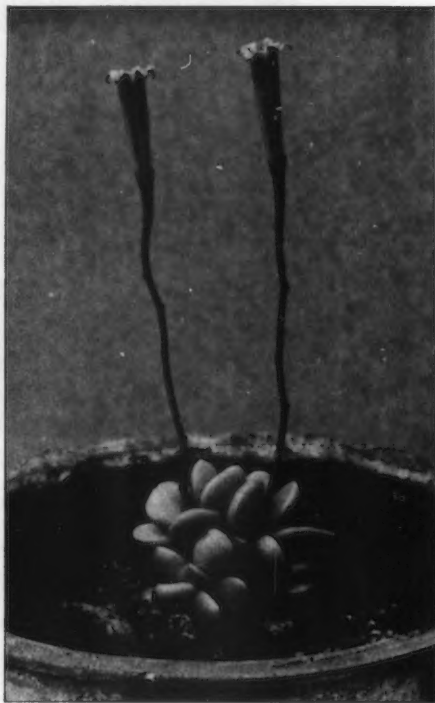


FIG. 32
Adromischus pauciflorus Hutchis., the clonotype,
U.C.B.G. 56.711-2.

absorb one's interest. I did see it on the summit of the same hill at Kinderle which was a veritable garden of miniature plants, the small, level area a bed of fine quartz grit about two inches in depth, below this perhaps an inch of gritty soil, then solid rock. In this grit grew *Odontophorus nanus*, *Crassula eendornensis*, *Anacampteros meyeri*, *Conophytum ectypum*, *Cheiridopsis meyeri*, *Crassula columnaris*, *Crassula deceptrix* and of course the tiny *Adromischus*. All were more or less covered with the grit, the *Adromischus* and *Crassula eendornensis* literally under the grit and so well-sheltered from the blistering sun. So even the layer of grit, so deep the plants, that casual walking over them scarcely injures them at all.

"I have not seen it south of Steinkopf. The furthest distance that I have seen it was at Uranoep, some 20 miles to the northeast of Steinkopf. There it was growing in crevices of

1. University of California Botanical Garden (Berkeley) Contribution Number 159.

2. *Desert Plant Life* 10 (12): 228, 1938.

3. *Bothalia* 3 (4): 640, 1939.

compressed micaceous shales, and was quite scarce. But there was no mistaking the small fat leaves, and I never forgot them since I first saw them in 1948."

The description below is based on both cultivated material (Berkeley) and pickled material from South Africa. Parenthetical remarks apply to the cultivated living plants.

Adromischus pauciflorus P. C. Hutchison, *sp. nov.* Herba parva; radices tuberosae; caules obsolescentes; folia obovata, asymmetrica, 1–1.5 cm. lata, 1.5–2.5 cm. longa, apices rotundata, concoloria vel apice atroviridia; inflorescentiae 1–2.5 (7) cm. longae, 1 (vel 2)-florae, pedicellis 0.5–1.0 (1–2) mm. longis, floribus apicalibus erectis; perianthium glabrum, tubo 1.2 (1.7) cm. longo, e basi gradatim expanso apice 3 (3.5) mm. diam., sectio transversa mediano rotundato, limbo lobis late deltoideo-acutis, obscure plicatis,

patentibus, apicibus recurvis; squamae nectariferae oblongae.

Roots tuberous. Stem obsolescent. Leaves densely crowded, erect to horizontal, usually obovate, but variable in shape, sometimes asymmetrical, up to 1 (2.5) cm. long and 0.75 to 1.5 cm. wide, in wild material about as wide as long, in cultivated usually longer than wide, 2 to 4 mm. thick, both the upper and lower faces convex, flattened, or concave, rounded at the apex, sometimes subacute, dark purple-red (concolorous) on the apical margin, immaculate, dull whitish green (bright shiny yellowish green). Inflorescence simple, a reduced 1- or 2-flowered raceme, the stalk 1 to 2.5 (7) cm. long, ca. 1 mm. in diameter, somewhat irregular, green, flecked with numerous, crowded, red-brown spots, glabrous, the flowers apical, erect. Pedicels bright green flecked with red-brown, 0.5 to 1.0 (1–2)

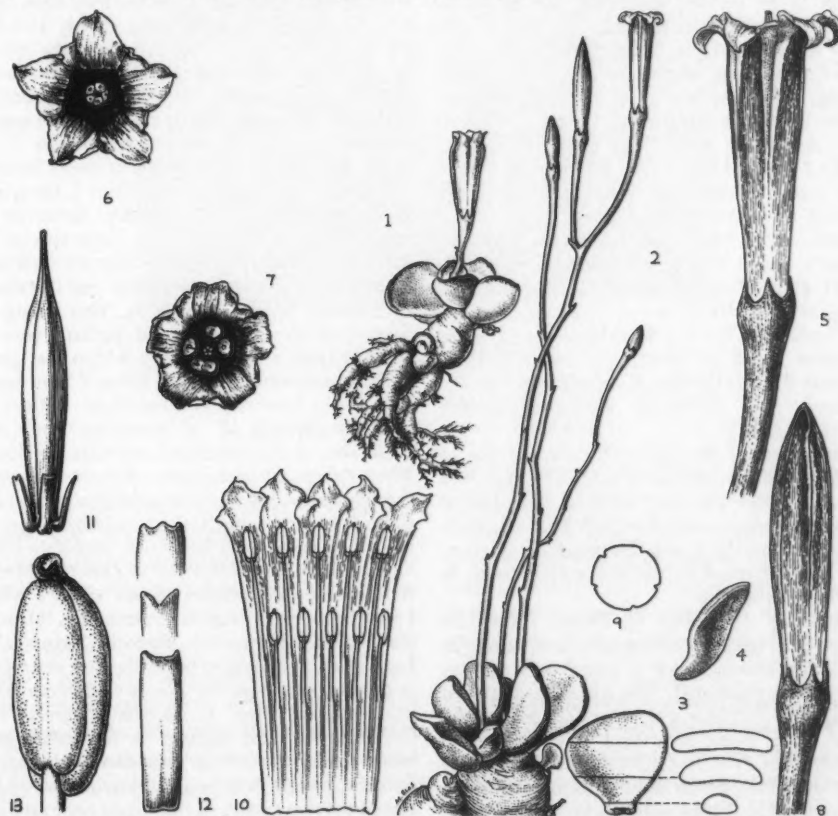


FIG. 33

Adromischus pauciflorus Hutchis. 1, 2. Plant. 3. Leaf, top view and cross-sections. 4. Leaf, side view. 5. Flower. 6. Perianth limb, spreading. 7. Perianth limb, fully expanded. 8. Bud. 9. Cross-section perianth tube at midpoint. 10. Stamen insertion. 11. Carpels. 12. Nectary scale and apices of variants. 13. Anther. 1-4, nat. size. 5-11, x 3. 12, x 9. 13, x 20. 1 is drawn from pickled material received from Africa, N.B.G. 205/56. 2-13 were drawn from a cultivated plant of the clonotype, U.C.B.G. 56.711-2. Drawing by Mrs. M. Blos, 1958.

cm. long, 1 to 1.5 (2) mm. thick, thinnest below and gradually thicker above, subtended by 1 or 2 concolorous bracts. *Calyx* lobes deltoid, acute, 1 mm. wide and long. Perianth usually glabrous inside and out,⁴ the tube green below, red-pink above, the inner surface whitish green below becoming suffused with dark pink in the upper third, 1.2 (1.7) cm. long, 2 to 2.5 mm. wide at base, expanding evenly to 3 (3.5) mm. at apex, the cross-section at midpoint rounded, the sinuses indented to about this point, conspicuously so in the upper $\frac{1}{4}$ to $\frac{1}{2}$ of the tube, prominent to base as whitish lines without red-brown flecks, these lines broadening in the upper half and widest at the throat, there about 1 mm. wide, the limb white to light and dark pink, the pigmentation strongest centrally and extending down the throat several mm., the lobes broadly deltoid, acute, ca. 3 mm. wide and long, very obscurely plicate at the sinuses, spreading, the apices recurved. *Stamens* biseriate, the filaments of the lower series 3 to 4 mm. long, of the upper series 5 to 6 mm. long, white, the anthers included, oblong, white, the two inner valves shorter, the terminal apiculus translucent. *Carpels* up to 10 (16) mm. long, green. Nectary scales oblong, 1.5 (2.7) mm. long, 0.5 to 0.8 mm. wide, the sides parallel, the apex concave, triangularly notched, or doubly notched, white.

South Africa, Namaqualand, the Richtersveld: Kinderle, about 7 miles northeast of Steinkopf, leg. H. Hall, National Botanic Garden, Kirstenbosch, 205/56, *University of California Botanical Garden* 56.711-2 (BOL-Holotype); about 10 miles north of Steinkopf, leg. H. Hall, National Botanic Garden, Kirstenbosch, 758/55, *University of California Botanical Garden* 55.721-1 (BOL).

Two plants of the type collection and one of the other are in cultivation here. The type was prepared from cultivated material, but one of the pickled plants received from Hall has been attached to this sheet, and the remainder of them have been returned to the Bolus Herbarium to supplement the type.

Poellnitz's description in *Desert Plant Life* has not been taken into account in preparing the description above, which is based only on material I have examined. The plant he described and figured, *Triebner 1318*, does not seem to be extant, either living or pressed. His reference to a specimen of *Pearson 09.3028* (at Kew?) from Aggenys, Little Bushmanland, as belonging to this species (in this he is following Schönland), is probably an error, for living material I have studied from Aggenys seems to be of the alliance of *A. schuldteanus* and *A. juttae*.

Schönland⁵ believed that *Cotyledon nana*

N. E. Br., was allied to *A. hemisphaericus* (L.) Lem., but this was an error if he meant to imply more than a generic similarity. *Adromischus nanus* (N. E. Br.) Poelln. is distinct in all respects from both *A. hemisphaericus* and *A. pauciflorus*, and is closest to *A. trigynus* (Burch.) Poelln.

This remarkable new species is the only dwarf *Adromischus* with long, narrow nectary scales and usually one-flowered inflorescences. Elsewhere in the genus a one-flowered inflorescence represents a depauperate condition, and is rarely seen, but in this species it is the normal condition. The floral morphology of *A. pauciflorus* is like that of *A. caryophyllaceus* (Burm. f.) Lem. [which is probably the same as *A. bolusii* (Schönl.) Berg.], *A. grandiflorus* Uitew., and *A. humilis* (Marl.) Berg. These four species form a distinct section within the genus, which will shortly be named. Together they seem to be the *Adromischus* species most closely allied to the genus *Cotyledon*, for they lack the spicate or subsapicate inflorescence that is typical of most *Adromischus* species, and have long nectary scales similar to those of some *Cotyledon* species but not found elsewhere in *Adromischus*.

At first glance, *A. pauciflorus* could be associated with *A. shaeferianus* (Dint.) Berg. and *A. boerleinianus* (Dint.) Poelln. However the resemblance is superficial, for these species belong in *Cotyledon*, I believe; they are closest to *Cotyledon sinus-alexandri* Poelln. and *Cotyledon bucholziana* Steph. & Schuldt. This group of four *Cotyledon* species (and perhaps others) seem to form a distinct group within that genus perhaps warranting sectional status. I have examined living, flowering material of all of them.

The occurrence of *A. pauciflorus* only in a small area of Namaqualand and adjacent South-West Africa, at some distance from the other three related species, which grow in south-central Cape Province, suggests that additional species, related to them, will be found, probably intermediate in range. *Adromischus humilis* (Marl.) Berg. is the only species of this alliance which I have not seen living. Thanks to Dr. Dyer of the National Herbarium, Pretoria, Transvaal, I have examined an isotype of the species, which is only known from the Nieuwveld Mountains, near Beaufort West; an excellent figure of this collection in color appears in Marloth's great work. Collectors in that area should attempt to find the species, which is extremely rare, and is one of the two species of this genus not examined by me as a living plant.

Completion of this paper was made possible by a John Simon Guggenheim Memorial Foundation Fellowship, 1959, and by a sabbatical leave from the University of California, Berkeley.

5. *Rec. Albany Mus.* 3: 152, 1915.

4. Papillae were observed in one flower in the area of the upper anthers.



FIG. 34
Echeveria agavoides

POTS, PLANTS AND PATIOS

Succulent plants have become increasingly popular in California and some of them are widely used as potted specimens to decorate patios, entrance ways, and odd corners of the garden. As a suitable subject for a larger container of any kind a succulent plant should have certain qualities; it should be comparatively easy to grow and need a minimum of care, it should have a good appearance at all times, and it should maintain this appearance over a period of years without repotting. Flowers are an added attraction but dependence is usually placed on plant form rather than flowering ability. Their variety of forms contribute to the use of many varying sizes and shapes of containers which makes for added attraction in the garden and

also lends to easy assembling of handsome and artistic groups at any time or place.

Some of the longer known succulents appear to be the most reliable, such as *Echeveria agavoides* and *E. elegans*, *Crassula arborescens* and *C. argentea*, *Aeonium haworthii* and *A. decorum*, some of the smaller Agaves, and a few others.

A plant of *Echeveria agavoides* Lem. is shown growing in a bowl-like Mexican pot. The overall diameter of the cluster is 30 cm. (ca. 12 ins.), and it retains a handsome appearance the year round, is reasonably hardy and easy to grow. At the time the photo was taken the plant had been growing in this pot for over 3 years.

PABLO

CEREUSLY SPEAKING

I am frequently asked by fellow amateur collectors how I acquired such an extensive collection of such varied nature: I think after 30 years of collecting I cannot remember the time when I did not anticipate acquiring a plant, new or old to me, and not having a place to put it.

The joy of acquisition has not dimmed either, which is not true of other plant families of my back yard and window garden. The succulent families are of such varied nature that a collection is slow to acquire, difficult to cultivate, a challenge for study, and above all, an ever increasing source of pleasure.

I always have a memory-picture-list of plants to be desired when I visit a collection no matter how small it may be. Usually these coveted plants are 'other succulents' rather than cacti but I am a collector of 'other succulents' too. I swap cuttings or plants and study their habits which insures their survival.

My Christmas Cactus plants which I have acquired from 1928 on, have flowered profusely since Jan. 21, 1960. The sources are Canada, New England, Virginia, S.W. USA, California, etc. Stems vary in length, breadth, thickness and toughness, teeth and no teeth, deeply serrated and slightly ribbed, but the flowers do not vary enough to be other than collector's items. Some are a slightly darker shade of cerise at the wide part of the bell, a turning back of the outer petals, wider or more narrow petals, an occasionally larger flower, or a slightly ribbed ovary. I do have a white one which resembles a *Zygo* stem, also reddish purple stemmed variety with an extra long flower tube of a brilliant orange with iridescent purple edges. These two lose their buds when kept too dry. Their flowering period is nearer Thanksgiving time as they resemble the *Zygocactus truncatus* in stem form and flower shape.

Is it possible to change the flowering time, as well as the growth cycle, of succulents from South America and Africa? Heredity is a strong incentive to these plants and they rest in *their winter* (our summer) and grow and flower in *their summer* (our winter). We usually think it is the length of day that causes plants to become dormant or to grow. I have used reduced waterings, cool parts of the greenhouse, and even given them extra heat without much water. The smaller succulents frequently become dormant and remain dormant until well into July and August; in other words, it is a drought period for them. The Euphorbias with greater mass, frequently go right on with their cycle; if kept too dry and cool, they lose their leaves and branches. I've even used lean soils. So far I have very little to report that I've changed the environment enough to alter the heredity. Slow up, speed up, yes to a limited degree in some species but thus far I have failed to convert them!

Have you tried water culture for Kalanchoes, Hoyas, Peperomias, etc.? *K. blossfeldiana* makes a fine showing and blooms regularly for me. *Hoya carnosa* becomes an excellent flowering specimen; I have one I've grown in water for 20 years. I've rooted globular as well as epiphytic cacti in water. The secret seems to be just to touch the surface of the water with the cutting; I use wire cradles for this purpose. I have grown some cacti for four years before transferring them to soil. *Haworthias* grow well in the water vases used for hyacinth bulbs; they make rapid growth with vigorous roots and they flower freely. Too much light (which succulents need) does grow algae on roots and glass; a minute amount of copper sulfate solution will not injure the plant but will control the algae.

Dissolved minerals in the water is the only requirement the soil gives except for anchorage, so the plant gets air and light for food-making from the air, water and minerals by the action of chlorophyll. If the water fouls, decay is present. Small pieces of charcoal helps to prevent this. After plants are growing, add water to replace evaporation. I'm talking about succulents to those who think all succulents grow dry. Try water culture too.

Hydroponics is the use of wire mesh covered with excelsior which sits in a trough of plant nutrients. The other method is sand-culture and pots may be used and these are set in tanks of nutrient solution. There are many hydroponic formulas on the market; I've used "Chem Grow" only.

In checking back on my notes I find that I have grown (after rooting in water) *Pereskias*, *Opuntias*, *Selenicereus*, *Echinocactus*, *Echinocereus*, *Mammillarias*, as well as *Rhipsalis*, *Schlumbergeras*, *Zygocactus*, and *Orchid Cactus*. No, I do not advocate such radical departures from orthodox methods but if all plants originated in or near the water (only a few billion years ago!) then they should not be too shocked to return to a semblance of their former pattern.

We have had a mild winter and two months are gone. If the pattern of weather cycles holds true we will have an early spring but after everything looks nice with leaves on the trees, birds nesting, spring flowers at their best, etc. we will have a mid-20 degrees or lower and everything will have a shock. I am not a pessimist but an optimist with a diary and voluminous weather notes. We are in the migratory path of the song birds going and coming but the north-going water fowl usually go west of us. I can only rely on the fall migration of geese as a warning to get my plants inside. I watch for the chimney swifts and purple martins to tell me when to put plants outside. Humming birds are late. I set some SW cacti out in April 1958 and 1959. Barring late freezes I think I can set the same plants out in late March this year.

My repotting, which is always sporadic, will be done from now until August if I feel like it. I do not disturb the roots unless decay is evident. I also water the plant thoroughly to keep the root ball intact. If there are tap roots which protrude or cover the surface soil, I do not believe in covering them. Any broken roots should be treated with sulphur and kept dry for a while.

Thank you for your letters some of which I have answered by notes or in my column. John E. C. Rodgers, 1229 Eighth St., Lorain, Ohio.

LOS ANGELES CACTUS AND SUCCULENT SOCIETY

The Southwest Cactus Growers, now the Los Angeles Cactus and Succulent Society, was originated by Don B. Skinner in 1935 as a weekly study group. Now the group meets once a month and has just held its Silver Anniversary, following 25 years of continuous existence, with numerous excellent Cactus and Succulent Shows—four of them under Don's direction.

The Anniversary celebration was held at the Agriculture Center, Fremont High School, through the courtesy of Mr. Skinner, and the Agriculture Teacher, Albert Guenzler. A fine exhibit of plants was featured under the direction of Chairman, Wm. E. Bentley. The afternoon was devoted to a regular meeting of the Society, opened by President Howard E. Snyder, and carried on by Chairman of the Day, Edw. S. "Ted" Taylor. A feature of the afternoon, was the Speaker, Dr. Reid Moran, Associate at the

Natural History Museum, Balboa Park, San Diego, California. An excellent showing of colored slides featuring classification of the Crassulaceae illustrated an outstanding talk. Many of the spectacular slides were taken in the Orient by Dr. Moran.

During the course of the afternoon Mr. Taylor presented many old-timers in the succulent world and

numerous one-time members of the L.A. group, some renewing their allegiance. Following is a short list of some of those attending: Mrs. Maybelle Place, Carl Hoffman, Mr. and Mrs. Harry Tate, J. R. Brown, Mr. and Mrs. Charles Kreuger, Frank Wilson, Don Kissinger, Mr. and Mrs. Edgar Baxter, Mrs. Neff Bakkers.

SPINE CHATS

By Ladislaus Cutak, 3339a Virginia St., St. Louis, Mo.

The Journal of South African Botany for October 1959 reports two new Aloes and two new Stapeliads. G. W. Reynolds describes *Aloe hazeliana* from Southern Rhodesia and *A. veseyi* from Northern Rhodesia. The first is a plant of compact growth with few to several slender erect stems from ground level, with distichous leaves, and a lateral inflorescence bearing green-tipped, scarlet flowers. The species is found in pockets of soil on rocks and in rock fissures on both sides of the Rhodesia-Mozambique border. It commemorates Mrs. Hazel Munch who first collected the plants in 1945. Its closest relative is *A. inyangensis* which differs from *A. hazeliana* in forming considerably larger denser clumps, and in having much shorter, thicker stems, more densely crowded leaves and longer bracts and pedicels.

Aloe veseyi clings to the precipices at Kalambo Falls where its stems hang downwards. The leaves are falcately-decurved with their apices pointing downwards and the slender branched inflorescence is also pendent with only the racemes upturned. It appears to be closely allied to *A. confusa* but differs from it chiefly in having much shorter thicker pendent stems, broader more densely rosulate pendent leaves, and shorter narrower flowers. The sap of *A. veseyi* is yellowish orange while that of *A. confusa* is deep purple and stains clothing.

Huernia leachii is the new stapeliad from Portuguese East Africa described by J. J. Lavranos who grew it in his garden at Johannesburg. It was first collected by Mr. L. C. Leach in 1956 who reported that the longest stem he measured was five feet long. Think of it! Its decumbent to slightly ascending, glabrous, green to purplish brown stems are nearly cylindric in habit and bear flowers in twos and threes from the lower half of the young stems; these being broadly campanulate and yellowish with transverse dark purple bands. This species resembles *H. pendula* in habit, but the flowers of the latter are smaller, uniformly dark purple brown on the inner corolla surface and the stems are thinner and less tapering than in the new species from which they also differ by the absence of the short tooth-like leaves.

Stapelia thudichumii is the second new stapeliad, this one hailing from the Karoo region and described by N. S. Pillans. It is closely allied with *S. revoluta* from which it is distinguished by the minute teeth and purple-brown mottling on the stems, the very much smaller papillate corolla and by other characteristic features. The species commemorates J. Thudichum who first collected the plant in 1954.

While on the subject of new plants, I might also bring to your attention two other Aloes which Mr. Reynolds described in the Journal of South African Botany, July 1959 issue. The first is *Aloe massawana* which hails from the shores of the Red Sea in Eritrea. In habit of growth and in leaf and rosette characters it bears a striking resemblance to *A. barbadensis*, but the latter differs in having a shorter thicker peduncle, shorter pedicels, and longer denser racemes of yellow flowers. The new plant is named

after the district of Massawa in Eritrea where considerable numbers were found in the wild. In inflorescence characters, *A. massawana* seems to be closely allied to *A. trichosantha* but the latter has longer racemes and tomentose perianths apart from very different leaves. *Aloe venusta* is the other new species but this one hails from Tanganyika Territory, where it was discovered on rocky outcrops at 4600 ft. It is said to be nearest allied to *A. macrosiphon* but the former differs in having leaves that are not glossy, leaf margins with a rather pronounced continuous pink cartilaginous edge, racemes with the apical buds denser and hidden by large fleshy imbricate bracts, slightly longer pedicels, and perianths that are pale scarlet and minutely pubescent. *A. macrosiphon* grows invariably in shady thickets on termite mounds in bush or woodland, with the inflorescences usually entangled in bush, whereas *A. venusta* was found only in scanty soils on exposed rocks, in an area infested with tsetse flies.

It is often difficult to start people to learn botanical names and to get them to understand technical jargon. With this foremost in mind, I had a new book published last year which I proposed to call "Cactus Personified." In order to entice new cactus friends I made an attempt to bring to their attention some of the fascinating novelties that occur within the cactus family and illustrated the book with full-page cartoons. The context contains a considerable amount of factual data, personal accounts of collecting experiences, and cultural hints written in simple, unaffected, conversational style to make reading vivid, clear and effortless. I think lots of people miss half the fun when they garden. They strive for perfection and fail to get fun out of it. Take for instance mimicry. This facet is very pronounced in the cactus family and that is why you will find beavertails, bunny ears, creeping devils and dancing bones to name a few. "Cactus Personified" is a different kind of garden book to be sure but one that should appeal to the beginner best of all. It is available through the author direct for two dollars.

The December 1959 issue of "Cactus," official publication of the French Cactus Society, contains a number of descriptions of new succulents under various authors. Martin Cardenas describes an *Echinopsis cerdana*, *Lobivia ciniensis*, *L. carquinensis* and *L. titicacensis*; J. Mamier-Lapostolle describes *Stapeliopsis ballyi*; and F. Ritter describes *Copiapoa calderana*, *C. columna-alba* and also a new genus *Chileorebutia* along with three species, *Chileorebutia kraussii*, *Ch. aerocarpa* and *Ch. glabrescens*. Cardenas' material comes from Bolivia while Ritter's comes from Chile. The *Stapeliopsis* comes from British Somaliland where it was discovered by Peter P. Bally in 1957 and introduced into Mons. Lapostolle's garden on the French Riviera. The type species of *Chileorebutia* is Schumann's old *Echinocactus reichei* (1903) which Britton & Rose later placed into *Malacocarpus* with their note "it is a very remarkable plant and may not be of this alliance."

Continued from page 61

loving types a pH of 6.5". Euphorbias also take an acid soil." Midge Whitol in New Jersey, in this robin says, "If you ever get to Washington, D.C. be sure to see the two large Euphorbia lactea crests in their cactus house at the Botanical Gardens. They are about 3' high and as wide and when I saw them in August they were snowed under with flowers—an astonishing sight. They are planted in a ground bed and must be very old as this plant grows very slowly".

Alta Tarango, from the Arranger's Robin, writes from California about an idea she heard from a friend. She said, "she used the common hen and chick Echeverias, paints them with poster paint to resemble waterlilies, then arranges them on a piece of mirror, adding leaves of some round leafed plant and used them as a dining table decoration. She said her guests always thought they were real waterlilies." The paint washes off, of course, afterward if you want to save your plants to use again sometime.

A plant that you don't often hear about gets a little praise from Pat Pfeil who lives in Wisconsin. She writes in Robin No. 5, "My Bowicea volubilis is really thriving. The asparagus-like vine died off completely and the split enlarged with the new bulb, larger than before, and a more brilliant shade of green. The old outer husk peeled off like layers of onion skin. At which time a new vine growth started, which is now about 1½ feet long, climbing right up the bent hanger with no help from me. It is really a most interesting plant and I'd advise one for every collector—they are well worth the price and the patience."

(Mrs.) Gladys H. Panis, P.O. Box 705,
Falmouth, Massachusetts

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